SUBJECT INDEX.

[References to the papers read before the Institute are indicated by the word *Paper* following the page number. The letter *P.* denotes a reference in Section I. of the Journal which contains the reports of the proceedings of meetings, the papers read, and the discussions thereon. The letter *A.* denotes a reference to the section dealing with abstracts.

Indexing of Alloy Steels and Other Alloys. In the indexing of alloy steels, carbon and iron are ignored and the alloying elements contained in the steel are arranged in alphabetical order; for example, all references to nickel-chromium-molybdenum steel will be found under the heading chromium-molybdenum-nickel steel. In the indexing of other alloys, carbon and iron, when present, are included in the title; iron, when present, is always mentioned first and the other elements follow in alphabetical order, carbon being in all cases mentioned last. Examples: "Iron-silicon-carbon alloys" and "iron-chromium-nickel-carbon alloys."]

ABRASION. *See* Wear.
ACETIC ACID, corrosion of metals, 36*A*.
ADAMS FORMULA, for calculating stresses in springs, 156*A*.
AFRICAN METALS CORPORATION, blast-furnace plant, 13*P*.
AGE-HARDENING, metals, 120*A*.
AGEING:
  effect on recovery of hardness, 29*A*.
  iron and steel, bibliography, 118*A*.
  strain-, sheets, effect of nitrogen, 154*A*.
  strain-, steel, effect of elements, 199, *Paper*.
AGGLOMERATING PLANTS, design and operation, 85*A*.
AGRICULTURAL EQUIPMENT, heat treatment, 60*A*.
AIRCRAFT CONSTRUCTION:
  use of alloys, 227*A*.
  use of forgings, 143*A*.
  use of stainless steel, 70*A*., 216*A*., 221*A*.
  use of steel, 227*A*.
AIRCRAFT ENGINES, production, 187*A*.
AIRCRAFT PARTS, welding, 221*A*.
ALABAMA IRON ORE, differential grinding, 203*A*.
ALKALIS:
  action on refractory materials, 87*A*., 206*A*.
  corrosion of steel, 36*A*.
ALLEGHENY LUDLUM STEEL CORPORATION PROCESS of electrolytic polishing, 113*A*.
ALLERDALE COAL CO., LTD., coal-cleaning plant, 132*A*.
ALLOYS:
  Alnico, magnetic properties, effect of cobalt and copper, 67*A*.
  aluminium, deformation, effect of notches, 67*A*.
  aluminium, heat treatment, corrosion of steel containers, 141*P*.
  aluminium, tensile tests, non-uniform yielding, 25*A*.
  cobalt-nickel-titanium, properties, 66*A*.
  copper, determination of arsenic, 75*A*.
  copper-nickel, change of torsional modulus with temperature and magnetisation, 29*A*.
  copper-nickel, damping coefficient, effect of magnetisation, 29*A*.
  corrosion-resistant, low-friction, 35*A*.
  Hyperm, magnetic properties, 29*A*.
  iron, corrosion by hydrogen sulphide, 36*A*.
  iron-aluminium-nickel, magnetic properties, effect of cobalt and copper, 66*A*.
  iron-aluminium-nickel, properties, 66*A*.
  iron-chromium, solubility of nitrogen, 124*A*.
  iron-chromium-nickel, properties, 227*A*.
  iron-copper-nickel, properties, 66*A*.

ALLOYS (*contd.*)—
iron - molybdenum - nickel, corrosion, 73*A*.
iron-nickel, change of torsional modulus with temperature and magnetisation, 29*A*.
iron-nickel, Curie point, effect of pressure, 199*A*.
iron-nickel, damping coefficient, effect of magnetisation, 29*A*.
iron-nickel, electrical resistance, 225*A*.
iron-vanadium, solubility of nitrogen, 124*A*.
Mishima, magnetic properties, effect of cobalt and copper, 67*A*.
use for aircraft construction, 227*A*.
ALNICO, magnetic properties, effect of cobalt and copper, 67*A*.
ALUMINA, effect in blast-furnace slag on furnace operation, 209*A*.
ALUMINISING PROCESS, 114*A*.
ALUMINIUM :
addition in open-hearth process, 182*A*.
detection in steel, 167*A*.
determination in cast iron, 166*A*.
effect in chromium-molybdenum steel, creep strength, 160*A*.
effect in steel, strain-ageing, 199*P*.
spraying, 114*A*.
ALUMINIUM ALLOYS :
deformation, effect of notches, 67*A*.
heat-treatment, corrosion of steel containers, 141*P*.
tensile tests, non-uniform yielding, 25*A*.
ALUMINIUM-NICKEL STEEL, magnetic properties, effect of cobalt and copper, 67*A*.
AMERICAN ROLLING MILL CO. :
plant, 11*A*.
rolling-mill plant, 13*A*.
ANAËROBIC CORROSION, 127*A*.
ANALYSIS, 75*A*., 166*A*., 234*A*.
spectrum, steel, 77*A*., 167*A*., 235*A*.
ANDREWS STEEL CO., plant, 11*A*.
ANISOTROPIC BEHAVIOUR, polycrystalline materials, 193*A*.
ANNEALING :
cast iron, 123*P*.
effect on steel, grain-size and drawing quality, 15*A*.
effect on steel, recovery of fatigue strength, 224*A*.
low-temperature, effect on cold-drawn chromium-vanadium steel, 195*A*.
ANNEALING (*contd.*)—
low-temperature, effect on cold-rolled chromium-nickel steel, elastic properties, 195*A*.
steel, effect of gases, 59*A*.
strip, 60*A*.
tool steel, 15*A*.
ANTHRACITE COAL CO., coal-cleaning plant, 89*A*.
ANTIMONY, determination in cast iron, 166*A*.
ANTI-PIPING COMPOUNDS, 181*A*.
ARMCO IRON :
deformation, effect of notches, 67*A*.
tensile tests, non-uniform yielding, 25*A*.
ARSENIC :
determination in bearing metals, 75*A*.
determination in cast iron, 166*A*.
determination in copper alloys, 75*A*.
determination in iron and steel, 75*A*.
ASSOCIATES, election, 9*P*.
ATMOSPHERES :
controlled, generation, 59*A*.
controlled, for heat-treatment furnaces, 15*A*., 59*A*., 106*A*.
effect on steel, wear, 28*A*.
AUSTENITE :
decomposition, 198*A*.
diffusion of carbon, 198*A*.
solubility of carbon, 137*P*.
AUSTRALIA, coal deposits, 1*A*.
AUSTRALIAN IRON AND STEEL, LTD. :
open-hearth plant, 100*A*.
transport of ingots, 101*A*.
AUTOMOBILE CYLINDERS, chromium plating, 21*A*.
AUTOMOBILE PARTS, moulding and casting, 136*A*.
AUTUMN MEETING, proceedings, 1*P*.
AXES, forging, 143*A*.
AXLES, fatigue strength, effect of metal spraying and flame-hardening, 156*A*.
AZOV STEELWORKS, turbo-blowers, 47*A*.

BAKING, wire rod, 144*A*.
BALLS :
lubricated, seizure, 157*A*.
wear, in grinding mills, 86*A*.
BARS, deformation under combined tension and torsion, 155*A*.
BASIC OPEN-HEARTH PRACTICE, 51*A*.

BASIC OPEN-HEARTH PROCESS :
control of inclusions, 12*A*.
slag control, 11*A*., 182*A*.
slag metal relationship, 53*A*.
sulphur control, 138*A*.
BASIC PROCESS, introduction in Japan, 100*A*.
BEARING METALS :
corrosion, 35*A*.
determination of arsenic, 75*A*.
BEENY'S DRILL TEST, 19*A*.
BELGIUM :
blast-furnace practice, 45*A*.
wire-drawing industry, 216*A*.
BEND FATIGUE TESTS, 66*A*.
BEND TESTS, 25*A*., 64*A*.
weld metal, 26*A*.
BENTONITE, mining, preparation and properties, 173*A*.
BENZOL WASH OILS, desulphurisation, 6*A*.
BERG CARBONISATION PROCESS, 177*A*.
BESSEMER PROCESS of continuous casting, 49*A*.
BETHLEHEM STEEL CO. :
blast-furnace practice, 178*A*.
pipe mills, 146*A*.
spectrographic laboratory, 77*A*.
waste-heat boilers, 4*A*.
BIBLIOGRAPHY, 80*A*., 170*A*., 240*A*.
ageing of iron and steel, 118*A*.
coal research, 175*A*.
effect of hydrogen on paint coatings, 191*A*.
effect of welding rod on properties of weld, 152*A*.
evaluation of inclusions, 251*P*.
manufacture of iron castings, 96*A*.
reduction of iron ore with carbon monoxide, hydrogen and methane, 211*A*.
scaling of steel, 55*A*.
BILLET MILLS, 102*A*.
BILLETS :
chipping, 20*A*.
continuous casting, Bessemer process, 49*A*.
descaling, 20*A*.
reheating furnaces, 142*A*.
BILLINGS & SPENCER, CO., forge plant, 143*A*.
BIRLEC LECTROMELT FURNACE, 54*A*.
BLADES, turbine, fatigue tests, 193*A*.
BLAENAVON, CO., LTD., open-hearth furnaces, 100*A*.
BLAST :
dry. Gayley's work, 135*A*.
mixing with hot air for blast furnaces, 94*A*.
BLAST-FURNACE GAS :
by-product recovery, 92*A*.
cleaning, Peabody washer, 45*A*.
cleaning, Simplex washer, 46*A*.
BLAST-FURNACE LININGS, carbon, 44*A*.
BLAST-FURNACE PLANT :
African Metals Corporation, 13*P*.
Hermann Göring Works, 45*A*.
Inland Steel Co., 46*A*., 94*A*.
South African Iron and Steel Industrial Corp., 13*P*.
Stewarts and Lloyds, Ltd., 45*A*.
Tata Iron and Steel Co., Ltd., 178*A*.
Richard Thomas & Co., Ltd., 45*A*.
BLAST-FURNACE PRACTICE :
Belgian, 45*A*.
Bethlehem Steel Co., 178*A*.
British, 45*A*.
British Colonies, 45*A*.
effect of coke quality, 134*A*.
effect of magnesia and alumina in slags, 209*A*.
European, 45*A*.
French, 45*A*.
German, 45*A*.
Italian, 45*A*.
Luxemburg, 45*A*.
Russian, 45*A*.
South African, 13, *Paper*.
variables encountered, 178*A*.
Zaporozhstal Works, 178*A*.
BLAST-FURNACE SLAG :
desulphurising power, 209*A*.
effect of magnesia and alumina contents on furnace operation, 209*A*.
use, 178*A*.
viscosity, 179*A*.
BLAST-FURNACE STOVES, insulation, 131*A*.
BLAST-FURNACES :
blast mixed with hot air, 94*A*.
blower, design, 208*A*.
clay gun, 178*A*.
coke charges, effect of preheating, 209*A*.
early, 135*A*.
hearth and bosh areas, 46*A*.
hearths, titanium in, 208*A*.
high blast temperatures, 47*A*.
smelting of zinc-bearing materials, 7*A*.
turbo blowers, 47*A*.
welded stacks, 135*A*.
BLAUT-LANG PROCESS of electrolytic polishing, 113*A*., 188*A*.
BLISTERS, formation during scaling of iron, 15*A*.

BLOOMING MILLS. *See* Cogging Mills.
BLOOMS, surface-quality, effect of soaking-pit practice, 141*A*.
BLOWERS :
for blast furnaces, design, 208*A*.
for cupolas, 180*A*.
turbo-, for blast-furnaces, 47*A*.
BLUE BRITTLENESS, sheets, effect of nitrogen, 154*A*.
BOIL, duration in open-hearth process, 51*A*.
BOILER TUBES, failure, due to overheating, 164*A*.
BOILERS :
caustic embrittlement, 37*A*., 232*A*.
cracking due to corrosion-fatigue, 165*A*.
pulverised-coal-fired, 132*A*.
waste-heat, 4*A*., 207*A*.
BOLTS, manufacture, 216*A*.
BONDERISING, 23*A*.
BOOK NOTICES :
Association of British Chemical Manufacturers. "Directory of British Fine Chemicals," 169*A*.
Camp, J. M., and C. B. Francis, "The Making, Shaping and Treating of Steel," Fifth Ed., 238*A*.
Heyer, R. H., "Engineering Physical Metallurgy," 40*A*.
Jevons, J. D., "Metallurgy of Deep Drawing and Pressing," 201*A*.
Kinzell, A. B., and R. Franks, "The Alloys of Iron and Chromium," Vol. II., High-Chromium Alloys, 78*A*.
London and Cambridge Economic Service, "The Iron and Steel Industry, 1926–1935," 169*A*.
Low, K. S., "Metallurgical and Industrial Radiology," 41*A*.
Miall, S., "A New Dictionary of Chemistry," 129*A*.
Society of Chemical Industry, "Reports of the Progress of Applied Chemistry," Vol. XXIV., 41*A*.
Thompson, Lilian G., "Sidney Gilchrist Thomas," 130*A*.
"Welded Steel Structures," 42*A*.
BRAKE DRUMS :
cast iron for, 194*A*.
centrifugal casting, 10*A*.
BRASS, deformation, effect of notches, 67*A*.
BRAZING, tubes, 151*A*.
BRENNSTOFF-TECHNIK, A.-G., carbonising ovens, 177*A*.
BRITTLE PHASE :
chromium-nickel steel, 31*A*.
chromium steel, 72*A*., 199*A*.
BRITTLENESS :
blue-, sheets, effect of nitrogen, 154*A*.
cold-, steel, 118*A*.
BROKEN HILL PROPRIETARY CO., LTD. :
reheating furnaces, 142*A*.
rolling-mill plant, 218*A*.
BRONZE WELDING, iron castings, 108*A*.
BROWN, BAYLEY'S STEEL WORKS, LTD., heat-treatment plant, 106*A*.
BUILDINGS, welded, 108*A*.
BULGARIA, manganese ore deposits, 1*A*.
BURNERS, for heat-treatment furnaces, 106*A*.
BURNS-WARNER PROCESS of electrolytic polishing, 113*A*.
BY-PRODUCTS :
recovery, 177*A*.
recovery from blast-furnace gas, 92*A*.

CADMIUM, electrodeposition, 114*A*.
CAKING INDEX, coal, Kattwinkel method of determination, 176*A*.
CALCIUM CARBIDE :
addition to pig iron, 45*A*.
desulphurisation of pig iron, 45*A*.
CALCIUM - MANGANESE - SILICON, deoxidation of chromium cast iron, 11*A*.
CALCIUM MOLYBDATE, determination of copper, 167*A*.
CANADA :
dolomite deposits, 43*A*.
refractory brick manufacture, 43*A*.
CANNOCK CHASE COLLIERY CO., LTD., brick-making plant, 3*A*.
"CARBANALYZER," 167*A*., 182*A*.
CARBIDE, iron, heat of formation, 52*A*.
CARBOMETER, 182*A*.
CARBON :
activated, passivating effect on iron, 36*A*.
determination in cast iron, 75*A*.
determination in coal, 237*A*.
determination in iron and steel, 167*A*.
determination, relative merits of Carbometer, Carbanalyzer and Leco carbon apparatus, 182*A*.

CARBON (*contd.*)—
diffusion in austenite, 198*A*.
effect in steel, strain-ageing, 199*P*.
effect in steel, strength, 161*A*.
effect in steel sheets, 120*A*.
elimination in open-hearth process, 51*A*., 213*A*.
solubility in austenite, 137*P*.
CARBON DIOXIDE, effect on steel during annealing, 59*A*.
CARBON LININGS, for blast furnaces, 44*A*.
CARBON MONOXIDE :
effect on steel during annealing, 59*A*.
reduction of iron ore, 209*A*.
reduction of iron ore, bibliography, 211*A*.
CARBON STEEL :
creep, 226*A*.
creep, effect of composition, 30*A*.
diffusion of carbon in austenite, 198*A*.
properties, 195*A*.
rolled, tensile strength, 153*A*.
thermal conductivity, 225*A*.
torsion tests at high temperatures, 26*A*.
yield point, 154*A*.
CARBONEUTRAL, 106*A*.
CARBONISATION :
low-temperature, 176*A*.
low-temperature, Berg process, 177*A*.
low - temperature, Kohlergas method, 176*A*.
low-temperature, Lurgi process, 177*A*.
low-temperature, Pintsch process, 177*A*.
CARBURISATION :
effect on hardness of core, 184*A*.
effect of particle size of carburising compound, 14*A*.
stainless steel, 104*A*.
steel, 148*A*.
use of energisers, 104*A*.
CARBURISING COMPOUNDS :
effect of particle size, 14*A*.
liquid, 219*A*.
solid, 104*A*.
CARBURISING STEEL, hardenability, 14*A*.
CARNEGIE-ILLINOIS STEEL CORPORATION :
electrical machinery, 102*A*.
rolling-mill plant, 145*A*.
CASE-HARDENING :
steel, 184*A*.
use of salt baths, 148*A*.

CAST IRON :
alloy, analysis, 166*A*.
alloy, properties, 227*A*.
alloy, use for railway equipment, 30*A*.
alloy, use in steelworks plant, 30*A*.
analysis, 75*A*.
annealing, 123*P*.
anti-friction, properties, 194*A*.
applications, 119*A*.
chromium, corrosion, 35*A*.
chromium, deoxidation with calcium-manganese-silicon, 11*A*.
chromium, frictional properties, 36*A*.
chromium, properties, 162*A*.
chromium-copper, properties, 162*A*.
chromium - copper - molybdenum - nickel, properties, 162*A*.
chromium-copper-nickel, properties, 162*A*.
chromium-nickel, hardness, 119*A*.
chromium-nickel, properties, 162*A*.
classification by structure, 71*A*.
contraction, 98*A*.
determination of copper, 234*A*.
effect of ladle additions, 69*A*.
electrical properties, 227*A*.
enamelling, 116*A*.
flame hardening, 59*A*.
gas evolution in cupolas, 96*A*.
hardening and tempering, graphite absorption, 16*A*.
hardness, 119*A*.
heat treatment, 219*A*.
high-duty, manufacture, 48*A*., 98*A*.
high-duty, properties, 227*A*.
impact strength, 193*A*.
ladle additions, 9*A*.
machinability, 119*A*.
magnetic properties, 227*A*.
malleable. *See* Malleable Cast Iron.
molybdenum-nickel, properties, 30*A*., 162*A*.
nickel, corrosion, 35*A*.
nickel, frictional properties, 36*A*.
nickel, properties, 69*A*.
oxidation, effect of chromium, 73*A*.
separation of inclusions, 236*A*.
silicon, properties, 30*A*.
specific heat, 227*A*.
stress relief, French specification, 16*A*.
tensile strength, effect of temperature, 25*A*.
thermal conductivity, 225*A*., 227*A*.
thermal expansion, 227*A*.
use for brake drums, 194*A*.
use for enamelling, characteristics, 9*A*.

CAST IRON (*contd.*)—
use for machine tools, 19*A*., 119*A*.
wear, 119*A*.
welding, 107*A*., 151*A*., 185*A*.
welding, retention of silicon from welding rod, 107*A*.
CASTING :
centrifugal, brake drums, 10*A*.
centrifugal, Mairey process, 9*A*.
centrifugal, pipes, 9*A*.
continuous, billets, Bessemer process, 49*A*.
continuous, billets, Hazelett process, 49*A*.
continuous, ingots, 10*A*.
rolls, 13*A*.
CASTING-PIT PRACTICE, 213*A*.
CASTINGS :
chromium-steel, cutting, 109*A*.
chromium-steel, properties, 69*A*.
corrosion-resistant, properties, 227*A*.
gating and feeding, 97*A*.
heat-resistant, properties, 227*A*.
iron, bronze welding, 108*A*.
iron, denseners for, 49*A*.
iron, manufacture, bibliography, 96*A*.
machine tool, manufacture, 96*A*.
steel, formation of cracks, 180*A*.
steel, inclusions, 98*A*.
steel, manufacture, 136*A*.
steel, solidification, 10*A*.
steel, specification, British, 196*A*.
steel, test-pieces for, 120*A*.
stress relief, 59*A*.
substitution by welding, 18*A*.
CATHODIC PROTECTION, tanks, 231*A*.
CAUSTIC EMBRITTLEMENT, boilers, 37*A*., 232*A*.
CEMENTITE, crystal structure, 95, *Paper*.
CENTRIFUGAL CASTING :
brake drums, 10*A*.
Mairey process, 9*A*.
pipes, 9*A*.
CHARCOAL, manufacture, 207*A*.
CHEMICAL EQUIPMENT, use of stainless steel, 69*A*.
CHEMICAL PLANT, welding, 63*A*.
CHIPPING, billets, 20*A*.
CHLORIDE SALT SOLUTIONS, corrosion of stainless steel, 73*A*.
CHLORINE, determination in coal and coke, 168*A*.
CHROME-MAGNESITE BRICKS. *See* Refractory Materials.
CHROME ORE, melting in electric furnace, 211*A*.
CHROME ORE DEPOSITS, India, 173*A*.
CHROMITE BRICKS. *See* Refractory Materials.
CHROMIUM :
effect in cast iron, oxidation, 73*A*.
effect in steel, 69*A*.
effect in steel for forgings, 51*A*.
effect in steel, strain-ageing, 199*P*.
electrodeposition, 21*A*.
CHROMIUM CAST IRON :
corrosion, 35*A*.
deoxidation with calcium-manganese-silicon, 11*A*.
frictional properties, 36*A*.
properties, 162*A*.
CHROMIUM COATINGS, corrosion, 163*A*.
CHROMIUM-COPPER CAST IRON, properties, 162*A*.
CHROMIUM - COPPER - MOLYBDENUM - NICKEL CAST IRON, properties, 162*A*.
CHROMIUM-COPPER-NICKEL CAST IRON, properties, 162*A*.
CHROMIUM-COPPER STEEL, inclusions, 72*A*.
CHROMIUM IRON, effect of nitrogen, 31*A*.
CHROMIUM - MANGANESE - MOLYBDENUM-NICKEL STEEL, machining, 110*A*.
CHROMIUM - MANGANESE - SILICON STEEL, welding cracks, 109*A*.
CHROMIUM-MANGANESE STEEL :
corrosion, 164*A*.
frictional properties, 36*A*.
properties, 31*A*.
CHROMIUM - MOLYBDENUM - NICKEL STEEL :
hardenability, 14*A*.
heating, 141*A*.
properties at low temperatures, 227*A*.
temperature coefficient of elastic modulus, 25*A*.
CHROMIUM - MOLYBDENUM - SILICON STEEL, effect of titanium and niobium, 70*A*.
CHROMIUM-MOLYBDENUM STEEL :
creep, 160*A*.
creep, effect of aluminium, 160*A*.
creep, effect of niobium, 160*A*.
creep, effect of silicon, 160*A*.
creep, effect of titanium, 160*A*.
effect of phosphorus, 70*A*.
heating, 141*A*.
properties at low temperatures, 226*A*.
relaxation tests at high temperatures, 161*A*.
torsion tests at high temperatures, 26*A*.

CHROMIUN - MOLYBDENUM STEEL (*contd.*)—
welding cracks, 109*A*.
CHROMIUM - MOLYBDENUM - STEEL TUBES, welding, 17*A*.
CHROMIUM - MOLYBDENUM - TUNGSTEN-VANADIUM STEEL, heat treatment, 105*A*.
CHROMIUM - MOLYBDENUM - VANADIUM STEEL, properties at low temperatures, 227*A*.
CHROMIUM-NICKEL CAST IRON :
hardness, 119*A*.
properties, 162*A*.
CHROMIUM-NICKEL COATINGS, corrosion, 39*A*.
CHROMIUM-NICKEL STEEL :
action of sulphur dioxide and hydrogen sulphide, 142*A*.
brittle phase, 31*A*.
carburisation, 104*A*.
cold-rolled, elastic properties, effect of low-temperature annealing, 195*A*.
corrosion, 164*A*.
corrosion, intercrystalline, effect of ferrite, 232*A*.
creep, effect of heat treatment, 159*A*.
frictional properties, 36*A*.
grinding, 188*A*.
heating, 141*A*.
impact tests at low temperatures, 68*A*.
properties, 69*A*.
silver-bearing, corrosion, 73*A*.
temperature coefficient of elastic modulus, 25*A*.
CHROMIUM STEEL :
brittle phase, 72*A*., 199*A*.
grinding, 188*A*.
heating, 141*A*.
transformations, effect of cooling rate, 34*A*.
CHROMIUM STEEL CASTINGS :
cutting, 109*A*.
properties, 69*A*.
CHROMIUM STEEL CYLINDERS, stress distribution, 26*A*.
CHROMIUM - TUNGSTEN - VANADIUM STEEL :
heat treatment, 105*A*.
properties, 120*A*.
CHROMIUM-VANADIUM STEEL :
cold-drawn, effect of low temperature annealing, 195*A*.
heating, 141*A*.
thermal expansion, 30*A*.
CLAD METALS, production, 21*A*.
CLAD STEEL, flame cutting, 221*A*.
CLAD TUBES, 22*A*.
CLEANING :
blast-furnace gas, Peabody washer, 45*A*.
blast-furnace gas, Simplex washer, 46*A*.
coal, 5*A*., 89*A*., 132*A*., 175*A*.
coal, clarification of washery water, 5*A*.
coal, Loess process, 5*A*.
metals, 20*A*., 112*A*., 188*A*.
stainless steel, 20*A*.
COAL :
caking index determination, Kattwinkel method, 176*A*.
carbonisation, low-temperature, 176*A*.
carbonisation, low-temperature, Berg process, 177*A*.
carbonisation, low-temperature, Kohlergas process, 176*A*.
carbonisation, low-temperature, Lurgi process, 177*A*.
carbonisation, low-temperature, Pintsch process, 177*A*.
cleaning, 5*A*., 89*A*., 132*A*., 175*A*.
cleaning, clarification of washery water, 5*A*.
cleaning, Loess process, 5*A*.
coking properties, 133*A*., 175*A*.
combustion, 4*A*.
constitution, 132*A*.
determination of carbon, 237*A*.
determination of sulphur and chlorine, 168*A*.
expansion, Kattwinkel-Baum-Shimomura apparatus for determining, 176*A*.
hydrogenation, 6*A*., 92*A*., 93*A*., 134*A*.
magnetic separation, 175*A*.
oil production, Fischer-Tropsch process, 93*A*.
oxidation, 92*A*.
plastic properties, 133*A*., 176*A*.
pulverised, flammability, 89*A*.
pulverised, use under boilers, 132*A*.
swelling, 90*A*.
swelling, Koppers oven for determining, 176*A*.
COAL-CLEANING PLANT :
Allerdale Coal Co., Ltd., 132*A*.
Anthracite Coal Co., 89*A*.
Société des Charbonnages de Faulquemont, 5*A*.
COAL DEPOSITS :
India, 84*A*.
Montana, 1*A*.
New South Wales, 1*A*.
North Dakota, 1*A*.

COAL DEPOSITS (*contd.*)—
Oklahoma, 1*A*.
COAL DUST, use in moulding sand, 137*A*.
COAL RESEARCH, bibliography, 175*A*.
COATED SHEETS, welding, 17*A*.
COATING, metals, 21*A*., 114*A*., 190*A*.
COATINGS :
chromium, corrosion, 163*A*.
chromium-nickel, corrosion, 39*A*.
copper, corrosion, 163*A*.
enamel, defects, effect of hydrogen in steel, 190*A*.
enamel, defects, effect of hydrogen in steel, bibliography, 190*A*.
galvanised, adherence, 115*A*.
galvanised, durability, 115*A*.
galvanised, streaking, 115*A*.
nickel, corrosion, 163*A*.
non-magnetic, thickness measurement, 116*A*.
organic, 23*A*.
paint, protective, 24*A*.
paint, surface treatment of steel before application, 191*A*.
phosphate, 191*A*.
phosphate-chromate, 191*A*.
protective, corrosion, 38*A*.
protective, effect on steel, corrosion-fatigue, 164*A*.
protective value, 126*A*.
tin, thickness measurement, 115*A*., 116*A*.
zinc, corrosion, 39*A*.
zinc-chromium, corrosion, 39*A*.
COBALT :
determination in cast iron, 166*A*.
effect in aluminium-nickel steel, magnetic properties, 67*A*.
effect in iron-aluminium-nickel alloys, magnetic properties, 66*A*.
effect in steel, 69*A*.
COBALT-NICKEL-TITANIUM ALLOYS, properties, 66*A*.
COBALT-TUNGSTEN STEEL, heat treatment, 105*A*.
COGGING MILLS : 102*A*.
electric driving, 218*A*.
COHESIVE STRENGTH, metals, 222*A*., 223*A*.
COKE :
combustibility, 90*A*.
desulphurisation, 91*A*.
determination of sulphur and chlorine, 168*A*.
effect of preheating in blast-furnace, 209*A*.
effect of quality on blast-furnace practice, 134*A*.
COKE (*contd.*)—
properties, 134*A*.
properties at high temperatures, 92*A*.
screening, 133*A*.
COKE-OVEN EQUIPMENT, welding, 18*A*.
COKE OVEN GAS, pyridine recovery, 91*A*.
COKE OVENS :
capacities, 5*A*.
control, 6*A*.
design, 5*A*.
heating, 90*A*.
insulating concrete for doors, 5*A*.
mechanical equipment, 132*A*.
self-sealing doors, 5*A*.
silica bricks, 88*A*.
COKING INDUSTRY, India, 207*A*.
COKING PLANT, Tata Iron & Steel Co., Ltd., 207*A*.
COKING PRACTICE, 6*A*., 90*A*.
COKING PROPERTIES, coal, 133*A*., 175*A*.
COLD-BRITTLENESS, steel, 118*A*.
COLD-DRAWN CHROMIUM-VANADIUM STEEL, effect of low-temperature annealing, 195*A*.
COLD-ROLLED CHROMIUM-NICKEL STEEL, elastic properties, effect of low-temperature annealing, 195*A*.
COLD-WORK, effect on steel, embrittlement, 65*A*.
COLOGNE CATHEDRAL, examination of iron parts, 39*A*.
COLUMBIUM. *See* Niobium.
COMBUSTIBILITY, coke, 90*A*.
COMBUSTION :
coal, 4*A*.
submerged, 4*A*.
COMMONWEALTH STEEL CO., LTD., heat-treatment plant, 184*A*.
COMPOSITE STEEL, manufacture, Pluramelt process, 22*A*.
COMPOSITION, effect on steel, creep properties, 30*A*.
COMPRESSION TESTS, 25*A*.
CONCENTRATES, manganese, production in Cuba, 45*A*.
CONCENTRATION, manganiferous iron ore, 203*A*.
CONDUCTIVITY :
electrical, iron and nickel, 118*A*.
thermal, cast iron, 227*A*.
thermal, iron and nickel, 118*A*., 225*A*.
CONSTITUTION, coal, 132*A*.
CONTRACTION, cast iron, 98*A*.

CONTROL :
coke-oven plants, 6*A*.
forge furnaces, 56*A*.
grain size in open-hearth practice, 51*A*.
inclusions in basic open-hearth process, 12*A*.
open-hearth furnaces, 11*A*., 101*A*., 182*A*.
slag in basic open-hearth process, 11*A*., 182*A*.
slag in open-hearth process, 139*A*.
sulphur in basic open-hearth process, 138*A*.
COOLING, pure iron, 152*A*.
COOLING RATE, effect on chromium steel, transformations, 34*A*.
COPPER :
determination in cast iron, 234*A*.
determination in iron and steel, 167*A*.
effect in aluminium-nickel steel, magnetic properties, 67*A*.
effect in iron-aluminium-nickel alloys, magnetic properties, 66*A*.
effect in steel, strain-ageing, 199*P*.
powdered, fatigue, 156*A*.
properties at low-temperatures, 226*A*.
tensile tests at high temperatures, 160*A*.
COPPER ALLOYS, determination of arsenic, 75*A*.
COPPER-CLAD TUBES, 22*A*.
COPPER-COATED SHEETS, welding, 17*A*.
COPPER COATINGS, corrosion, 163*A*.
COPPER-NICKEL ALLOYS :
change of torsional modulus with temperature and magnetisation, 29*A*.
damping coefficient, effect of magnetisation, 29*A*.
COPPER-NICKEL STEEL, corrosion, 163*A*.
COPPER-PLATING, tubes, Mecano-Bundy process, 21*A*.
COPPER STEEL :
corrosion, 38*A*., 163*A*., 191*P*.
inclusions, 72*A*.
precipitation hardening, 193*A*.
COPPERWELD STEEL CO., plant, 138*A*., 213*A*.
CORE-BLOWING MACHINES, 9*A*.
CORE OILS, tests, 137*A*.
CORRODIBILITY, relative, iron and steel, 165*P*.
CORROSION :
bearing metals, 35*A*.
CORROSION (*contd.*)—
chromium cast iron, 35*A*.
chromium coatings, 163*A*.
chromium-manganese steel, 164*A*.
chromium-nickel coatings, 39*A*.
chromium-nickel steel, 164*A*.
commencement, study by photo-electric determination of iron as sulphide, 35*A*.
copper coatings, 163*A*.
copper-nickel steel, 163*A*.
copper steel, 191*P*., 38*A*., 163*A*.
electrolytic, ships, 38*A*., 73*A*.
heat treatment pots, 141*P*., 200*A*.
heating and hot water systems, 38*A*.
intercrystalline, 31*A*.
intercrystalline, chromium-nickel steel, effect of ferrite, 232*A*.
iron alloys by hydrogen sulphide, 36*A*.
iron-molybdenum-nickel alloys, 73*A*.
iron-ore wagons, 191, *Paper*.
metals by combustion products of natural gas, 35*A*.
microbiological anaërobic, 127*A*.
nickel cast iron, 35*A*.
nickel coatings, 163*A*.
pinhole, galvanised tanks, 37*A*.
pipes, 200*A*.
protective coatings, 38*A*.
refrigerators, 37*A*.
silver-bearing chromium-nickel steel, 73*A*.
stainless steel in chloride salt solutions, 73*A*.
stainless steel in hydrochloric acid, 73*A*.
steel, 191*P*.
steel in alkalies, 36*A*.
steel by molten nitrates, 141, *Paper*.
steel in sea-water, 126*A*.
tin containers, 232*A*.
zinc-chromium coatings, 39*A*.
zinc coatings, 39*A*.
CORROSION-FATIGUE :
boilers, 165*A*.
metals, 120*A*.
steel, effect of protective coatings, 164*A*.
CORROSION RESEARCH, French, 126*A*.
CORROSION-RESISTANT ALLOYS, low-friction, 35*A*.
CORROSION-RESISTANT CASTINGS, properties, 227*A*.
CORROSION-RESISTANT STEEL, properties, 31*A*.
CORROSION TESTS, accelerated spray, 165, *Paper*.

CORROSIVENESS, water, measurement, 163*A*.
CRACK STRENGTH, static, metals, 222*A*., 223*A*.
CRACKS :
  effect on steel, impact and tensile strength, 223*A*.
  fatigue, formation, 224*A*.
  in boilers, due to corrosion fatigue, 165*A*.
  in steel castings, 180*A*.
  welding, in steel, 108*A*.
CRALFER, properties, 162*A*.
CRANKSHAFTS :
  flame hardening, 59*A*.
  machinability, effect of gases and oxides, 110*A*.
CREEP :
  alloy steel, 161*A*.
  carbon steel, 226*A*.
  chromium-molybdenum steel, 160*A*.
  chromium-molybdenum steel, effect of aluminium, 160*A*.
  chromium-molybdenum steel, effect of niobium, 160*A*.
  chromium-molybdenum steel, effect of silicon, 160*A*.
  chromium-molybdenum steel, effect of titanium, 160*A*.
  chromium-nickel steel, effect of heat treatment, 159*A*.
  molybdenum steel, 160*A*., 226*A*.
  molybdenum steel, effect of manganese, 160*A*.
  molybdenum steel, effect of vanadium, 226*A*.
  steel, effect of composition, 30*A*.
CREEP TESTS, 120*A*.
  interpretation of results, 160*A*.
  maintenance of load, 159*A*.
CREEP-TORSION TESTS, 30*A*.
CRUCIBLE STEEL, manufacture, 138*A*.
CRUCIBLE STEEL CO., OF AMERICA, plant, 138*A*.
CRYSTAL GROWTH, 71*A*.
CRYSTAL ORIENTATION in silicon iron, 72*A*.
CRYSTAL SIZE, effect on steel, strain-ageing, 213*P*.
CRYSTALLISATION, primary, steel, 33*A*.
CRYSTALS :
  iron, elasticity modulus, 158*A*.
  iron, magnetic viscosity, 29*A*.
  iron, magneto-resistance effect, 225*A*.
  iron, rigidity modulus, 158*A*.
  preferred orientation, 193*A*.
  single, properties, 193*A*.
CUBA :
  manganese ore deposits, 84*A*.
  production of manganese concentrates, 45*A*.
CUPOLA PRACTICE, 48*A*.
CUPOLAS :
  blowers, 180*A*.
  gas evolution of cast iron, 96*A*.
CUPPING TESTS, 25*A*.
CURIE POINT, iron-nickel alloys, effect of pressure, 199*A*.
CUTTING :
  chromium steel castings, 109*A*.
  flame, 152*A*., 221*A*.
  steel, 18*A*., 109*A*.
CUTTING FLUIDS, selection, 111*A*.
CYLINDERS :
  automobile, chromium plating, 21*A*.
  chromium-steel, stress distribution, 26*A*.
  engine, moulding, 49*A*., 98*A*.
  pitting, effect of lubrication, 28*A*.
  welding, 63*A*.

DAMPING COEFFICIENT, ferromagnetic substances, effect of magnetisation, 29*A*.
DEEP DRAWING, steel, 143*A*.
DEEP-DRAWING PROPERTIES, steel, effect of tin, 56*A*.
DEEP-DRAWING STEEL, spot welding, 62*A*.
DEFECTOSCOPE, 123*A*.
DEFECTS :
  detection by magnetic means, 123*A*., 229*A*.
  in alloy steel, effect of soaking-pit practice, 141*A*.
  in enamel coatings, effect of hydrogen in steel, 190*A*.
  in enamel coatings, effect of hydrogen in steel, bibliography, 190*A*.
  in welds, 152*A*.
DEFORMATION :
  bars, under combined tension and torsion, 155*A*.
  metals, 123*A*.
  metals, effect of notches, 67*A*.
DE LATTRE PROCESS of pickling, 189*A*.
DENSENERS for iron castings, 49*A*.
DEOXIDATION :
  chromium cast iron with calcium-manganese-silicon, 11*A*.
  steel with silico-manganese, 11*A*.
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH, NEW ZEALAND, spectrographic laboratory, 167*A*.

DEPHOSPHORISATION, steel, Perrin process, 35*P*.
DESCALING :
billets, 20*A*.
steel, 188*A*.
DESULPHURISATION :
benzol wash oils, 6*A*.
coke, 91*A*.
iron, action of blast-furnace slag, 209*A*.
pig iron by calcium carbide, 45*A*.
pig iron by sodium carbonate, 94*A*.
pig iron by sodium silicate, 94*A*.
DIE STEEL :
hardening, 105*A*.
properties, 31*A*.
DIES :
cast iron, 143*A*.
cast iron, steel faced, 56*A*.
manufacture, 216*A*.
DIFFUSION, hydrogen in steel, 68*A*.
DOLOMITE DEPOSITS, Canada, 43*A*.
DRAWABILITY, steel sheets, effect of nitrogen, 154*A*.
DRAWING, steel, effect of annealing, 15*A*.
DRILL TESTS, 111*A*.
Beeny's, 19*A*.
DUCTILE METALS, plastic yielding and fatigue, 66*A*.

ELASTIC MODULUS :
iron crystals, 158*A*.
temperature coefficient, 25*A*.
ELASTIC PROPERTIES, cold-rolled chromium-nickel steel, effect of low-temperature annealing, 195*A*.
ELECTRIC CURRENTS, use in heat treatment, 14*A*.
ELECTRIC DRIVING, rolling mills, 102*A*., 145*A*., 218*A*.
ELECTRIC FURNACES :
arc, 53*A*.
Birlec Lectromelt, 54*A*.
design, 101*A*.
for foundry use, 9*A*.
high-frequency, manufacture of steel, 139*A*.
high-frequency, refractory materials for, 174*A*.
manufacture of alloy steel, Kirov method, 214*A*.
manufacture of forge steel, 53*A*.
smelting of chrome ore, 211*A*.
ELECTRIC POWER :
use in American steel plants, 4*A*.
use in French iron industry, 89*A*.
ELECTRICAL CONDUCTIVITY, iron and nickel, 118*A*.
ELECTRICAL MACHINERY, ventilating equipment, 102*A*.
ELECTRICAL PROPERTIES, cast iron, 227*A*.
ELECTRICAL RESISTANCE :
iron, 225*A*.
iron crystals, 225*A*.
iron-nickel alloys, 225*A*.
nickel, 225*A*.
ELECTRICAL TESTS, piston rings, 118*A*.
ELECTRICITY, use in metallurgy, 5*A*.
ELECTRODEPOSITED IRON, for supporting metallographical specimens, 89*P*.
ELECTRODEPOSITION :
cadmium, 114*A*.
chromium, 21*A*.
iron from silicate melts, 53*A*.
metals, 21*A*., 114*A*.
tin, 22*A*.
ELECTRODES :
welding, calculation of weight and number required, 17*A*.
welding, coating thickness, 107*A*.
welding, coatings, effect on grain-size of weld metal, 18*A*.
ELECTROLYTIC IRON :
electrical conductivity, 118*A*.
galvanic effects, 118*A*.
thermal conductivity, 118*A*.
thermomagnetic effects, 118*A*.
ELECTROLYTIC POLISHING, 32*A*., 112*A*.
Allegheny Ludlum Steel Corp. process, 113*A*.
Blaut-Lang process, 113*A*., 188*A*.
Burns-Warner process, 113*A*.
Fink-Kenny process, 113*A*.
Kelvie process, 113*A*.
Larsen process, 113*A*.
Marino process, 113*A*.
EMBRITTLEMENT :
caustic, boilers, 37*A*., 232*A*.
steel, effect of cold work, 65*A*.
steel at high temperatures, 226*A*.
ENAMEL, removal from steel, 24*A*.
ENAMEL COATINGS :
defects, effect of hydrogen in steel, 190*A*.
defects, effect of hydrogen in steel, bibliography, 190*A*.
ENAMELLING :
cast iron, 116*A*.
steel, effect of phosphorus, 23*A*.
ENAMELLING CAST IRON :
annealing, 140*P*.
characteristics, 9*A*.
ENAMELS, leadless, 46*A*.

ENGINES, aircraft, production, 187*A*.
EQUILIBRIUM DIAGRAMS, construction, use of free energy principle, 107, *Paper*.
ETTINGSHAUSEN EFFECT, 118*A*.
EXPANSION :
coal, Kattwinkel-Baum-Shimomura apparatus for determining, 176*A*.
refractory materials, 206*A*.
thermal, cast iron, 227*A*.
thermal, chromium-vanadium steel, 30*A*.
EXTENSOMETER, carbon-strip, 65*A*.
EXTRUSION, valves, 143*A*.

FAGERSTA WORKS, plant, 100*A*.
FAILURE :
boiler tubes, due to overheating, 164*A*.
gun barrel, 155*A*.
FATIGUE :
cast iron, 193*A*.
corrosion-, boilers, 165*A*.
corrosion-, metals, 120*A*.
corrosion-, steel, effect of protective coatings, 164*A*.
ductile metals, 66*A*.
porous metals, 156*A*.
steel, 65*A*.
FATIGUE CRACKS, formation, 224*A*.
FATIGUE STRENGTH :
axles, effect of metal spraying and flame-hardening, 156*A*.
recovery by annealing, 224*A*.
torsional, steel of different sections, 223*A*.
FATIGUE TESTING MACHINES, 156*A*.
for small-diameter wire, 156*A*.
FATIGUE TESTS, 120*A*.
bend, 66*A*.
turbine blades, 193*A*.
welded joints, 108*A*.
FERRITE, effect in chromium-nickel steel, intercrystalline corrosion, 232*A*.
FERRO-CHROMIUM, manufacture, 211*A*.
FERROMAGNETIC SUBSTANCES :
change of torsional modulus with temperature and magnetisation, 29*A*.
damping coefficient, effect of magnetisation, 29*A*.
FERRO-MOLYDENUM, determination of copper, 167*A*.
FERRO-SILICON, manufacture, 211*A*.
FERRO-TUNGSTEN, determination of copper, 167*A*.
FERRO-VANADIUM, determination of phosphorus, 167*A*.
FILMS :
protective, use of silico-organic compounds, 23*A*.
surface, removal from metals, 20*A*.
FINK-KENNY PROCESS of electrolytic polishing, 113*A*.
FINLAND, mineral deposits, 173*A*.
FIREBRICKS. *See* Refractory Materials.
FIRTH-BROWN METHOD of counting inclusions, 237*P*.
FISCHER-TROPSCH PROCESS, 93*A*.
FLOW, plastic, metals, 64*A*.
FLOWABILITY TESTS, moulding sand, 97*A*.
FORD MOTOR CO., foundry plant, 136*A*.
FORGE FURNACES, control, 56*A*.
FORGE STEEL :
effect of elements, 51*A*.
manufacture in electric furnaces, 53*A*.
FORGING :
axes, 143*A*.
hammers, 143*A*.
railway material, 60*A*.
tool steel, 216*A*.
FORGING PRACTICE, 143*A*.
FORGINGS, for aircraft construction, 143*A*.
FOUNDRIES :
equipment, 180*A*.
use of electric furnaces, 9*A*.
FOUNDRY PLANT :
Ford Motor Co., 136*A*.
West Michigan Steel Foundry Co., 136*A*.
FOUNDRY PRACTICE, 9*A*., 48*A*., 96*A*., 136*A*., 180*A*.
FOX METHOD of counting inclusions, 237*P*.
FRANCE :
blast-furnace practice, 45*A*.
corrosion research, 126*A*.
iron industry of Nevers district, 47*A*.
iron industry, use of electric power, 89*A*.
specification for stress-relief of cast iron, 16*A*.
FREE ENERGY PRINCIPLE, use in construction of equilibrium diagrams, 107, *Paper*.
FRETZ-MOON PROCESS of tube manufacture, 13*A*., 146*A*.
FRICTIONAL PROPERTIES, metals, 36*A*.
FUEL, pulverised. *See* Coal, pulverised.

FURNACES, :
blast. *See* Blast-Furnaces.
electric. *See* Electric Furnaces.
forge. *See* Forge Furnaces.
heat-treatment. *See* Heat-Treatment Furnaces, Annealing Furnaces, &c.
open-hearth. *See* Open-Hearth Furnaces.
reheating. *See* Reheating Furnaces and Soaking Pits.
reverberatory, refractory materials, 44*A*.
FWD AUTO CO., heat-treatment plant, 150*A*.

GALVANIC EFFECTS, iron and nickel, 118*A*.
GALVANISED COATINGS :
adherence, 115*A*.
durability, 115*A*.
streaking, 115*A*.
GALVANISED SHEETS, welding, 108*A*.
GALVANISED TANKS, corrosion, pinhole, 37*A*.
GALVANISING :
fluxing technique, 190*A*.
pipes, 115*A*.
sheets, 115*A*.
wire, 22*A*.
GALVANISING KETTLE, 22*A*.
use of fuel oil, 114*A*.
GAMMA-RAYS, smallest dimension of internal crack revealed, 71*A*.
GAS :
blast-furnace. *See* Blast-Furnace Gas.
coke-oven. *See* Coke-Oven Gas.
natural, corrosion of metals, 35*A*.
GAS-MIXING SYSTEMS, 89*A*.
GAS PRODUCERS. *See* Producers.
GASES :
determination in steel, 76*A*.
effect on steel during annealing, 59*A*.
GATING, castings, 97*A*.
GEARS :
heat treatment, 150*A*.
welding, stress control, 108*A*.
GERMANY :
blast-furnace practice, 45*A*.
iron industry, 94*A*., 95*A*.
iron ore deposits, 1*A*.
low-temperature carbonisation, 176*A*.
GLASS WOOL, manufacture, 47*A*.
GLYCERINE, use in metal processing, 21*A*.
GOHNER FORMULA, for calculating stresses in springs, 156*A*.
GRAIN BOUNDARIES, hardness tests, sclero-grating method, 277*P*.
GRAIN SIZE :
control in open-hearth practice, 51*A*.
effect in steel, hardenability, 157*A*.
in high-speed steel, 197*A*.
in steel, 71*A*.
in steel, determination, 197*A*.
in steel, effect of annealing, 15*A*.
in steel, effect of welding current, 107*A*.
weld metal, effect of electrode coatings, 18*A*.
GRAINAL-TREATED STEEL, properties, 157*A*.
GRAPHITE :
absorption during hardening of cast iron, 16*A*.
solubility in iron, 52*A*.
solubility in iron-aluminium melts, 52*A*.
solubility in iron-silicon melts, 52*A*.
GREAT LAKES STEEL CORP. :
spectographic laboratory, 235*A*.
turbo-blowers, 208*A*.
GRINDING :
chromium-nickel steel, 188*A*.
chromium-steel, 188*A*.
metallographic, 32*A*., 228*A*.
quenched steel, structural changes, 186*A*.
rolls, 187*A*.
GRINDING MILLS, wear of balls, 86*A*.
GUN BARREL, failure, 155*A*.

HALL EFFECT, 118*A*.
HAMMERS, forging, 143*A*.
HARDENABILITY :
carburising steel, 14*A*.
steel, effect of grain size, 157*A*.
HARDENED PARTS, straightening, 220*A*.
HARDENING :
age-, metals, 120*A*.
cast iron, graphite absorption, 16*A*.
cyanide, 219*A*.
die steel, 105*A*.
flame, 104*A*.
flame, axles, effect on fatigue strength, 156*A*.
flame, cast iron, 59*A*.
flame, crankshafts, 59*A*.
flame, Shorter process, 148*A*., 149*A*., 219*A*.
high-speed steel, 148*A*.
precipitation, copper steel, 193*A*.
surface, induction method, 14*A*.

HARDENING (*contd.*)—
tool steel, dimensional changes, 150*A*.
use of salt baths, 148*A*.
HARDENING FURNACES, electric, 150*A*.
HARDENING MACHINE, flame, 149*A*.
HARDNESS :
cast iron, 119*A*.
changes, effect of repeated stress, 29*A*.
chromium-nickel cast iron, 119*A*.
recovery, effect of ageing, 29*A*.
steel in the stressed state, 193*A*.
HARDNESS CONVERSION TABLE, 156*A*.
HARDNESS TESTING MACHINES, pendulum, 27*A*.
HARDNESS TESTS, 25*A*.
Rockwell, British standard method for reading, 27*A*.
sclero-grating method, 277*P*.
sources of error, 27*A*.
HASSELT BRIDGE, examination of welded specimens, 17*A*.
HAZELETT PROCESS of continuous casting, 49*A*.
HEAT :
specific, cast iron, 227*A*.
waste, utilisation, 4*A*., 207*A*.
HEAT OF FORMATION, iron-carbide, 52*A*.
HEAT-RESISTANT CASTINGS, properties, 227*A*.
HEAT-RESISTANT STEEL, properties, 31*A*.
HEAT TRANSFER, open-hearth furnaces, 50*A*.
HEAT TREATMENT, 14*A*., 59*A*., 104*A*., 148*A*., 184*A*., 219*A*.
agriculture equipment, 60*A*.
aluminium alloys, corrosion of steel containers, 141*P*.
cast iron, 219*A*.
chromium-nickel steel, effect on creep, 159*A*.
gears, 150*A*.
high-speed steel, 105*A*., 106*A*.
malleable cast iron, 16*A*., 220*A*.
Meehanite, distortion, 184*A*.
railway material, 60*A*.
steel, structural changes, 105*A*.
tool steel, 60*A*.
tyres, 106*A*.
use of electric currents, 14*A*.
HEAT-TREATMENT FURNACES :
burner system, 106*A*.
controlled atmospheres, 15*A*., 59*A*., 106*A*.
use for sheets and strip, 106*A*.
use for tubes, 220*A*.
HEAT-TREATMENT POTS, corrosion, 141*P*., 200*A*.
HEATING :
pure iron, 152*A*.
steel, 141*A*.
HERMANN GÖRING WORKS, plant, 45*A*.
HEWITT'S METHOD for valuation of iron ore, 45*A*.
HIGH-DUTY ALLOYS, LTD., laboratory equipment, 122*A*.
HIGH SPEED STEEL :
cutting efficiency, 186*A*.
grain size, 197*A*.
hardening, 148*A*.
heat treatment, 105*A*., 106*A*.
properties, 19*A*., 121*A*.
stepped quenching, 60*A*.
HISTORY, working of metals, 120*A*.
HOLES, effect on steel, impact and tensile strength, 223*A*.
HUNGARY, iron industry, 7*A*.
HYDROCHLORIC ACID :
corrosion of metals, 36*A*.
corrosion of stainless steel, 73*A*.
HYDROGEN :
diffusion in steel, 68*A*.
effect on enamel coatings, 190*A*.
effect on enamel coatings, bibliography, 190*A*.
effect on steel during annealing, 59*A*.
reduction of iron ore, 209*A*.
reduction of iron ore, bibliography, 211*A*.
HYDROGEN SULPHIDE :
action on steel, 142*A*.
corrosion of iron alloys, 36*A*.
separation of zinc from iron, 77*A*.
HYDROGENATION, coal, 6*A*., 92*A*., 93*A*., 134*A*.
HYPERM ALLOYS, magnetic properties, 29*A*.
HYPERSILID, properties, 30*A*.

ICE CREAM CANS, tinning, 23*A*.
ILLINOIS COAL, cleaning, 132*A*.
IMPACT STRAINS, measurement, 65*A*.
IMPACT STRENGTH :
cast iron, 193*A*.
steel, effect of notches, holes and cracks, 223*A*.
IMPACT TEST-PIECES, cylindrical, 117*A*.
IMPACT TESTS, 25*A*., 117*A*.
steel at low temperatures, 67*A*., 68*A*.

INCLUSIONS :
classification, SAE Method, 124*A*.
control in basic open-hearth process, 12*A*.
counting, 237*A*.
evaluation, 237, *Paper*.
evaluation, bibliography, 251*P*.
evaluation, Firth-Brown method, 237*P*.
evaluation, Fox method, 237*P*.
evaluation, Jernkontoret method, 237*P*.
grain-boundary, in steel, 33*A*.
in chromium-copper steel, 72*A*.
in copper steel, 72*A*.
in steel castings, 99*A*.
separation from cast iron, 236*A*.
INDIA :
chrome ore deposits, 173*A*.
coal deposits, 84*A*.
coking industry, 207*A*.
iron ore deposits, 84*A*.
INGOTS :
anti-piping compounds, 181*A*.
continuous casting, 10*A*.
defects, 139*A*.
formation of crusts, 54*A*.
surface quality, 52*A*.
transfer cars, 101*A*.
INLAND STEEL CO., blast-furnace plant, 46*A*., 94*A*.
INSULATING MATERIALS, 44*A*.
INSULATION, blast-furnace stoves, 131*A*.
INTERMETALLIC COMPOUNDS :
composition, 120*P*.
liquidus curves, 125*A*.
IRON :
ageing, bibliography, 118*A*.
change of torsional modulus with temperature and magnetisation, 29*A*.
deformed, lattice distortion, 192*A*.
desulphurisation, action of blast-furnace slag, 209*A*.
determination, 166*A*., 234*A*.
effect of elements, 120*A*.
electrical conductivity, 118*A*.
electrical resistance, 225*A*.
electrodeposited, for supporting metallographical specimens, 89*P*.
electrodeposition from silicate melts, 53*A*.
galvanic effects, 118*A*.
heating and cooling, 152*A*.
passivating effect of activated carbon, 36*A*.
powdered, fatigue, 156*A*.
IRON (*contd.*)—
production, 7*A*., 45*A*., 94*A*., 135*A*., 178*A*., 208*A*.
properties at low temperatures, 226*A*.
scaling, blister formation, 15*A*.
separation from zinc by hydrogen sulphide, 77*A*.
solubility of graphite, 52*A*.
thermal conductivity, 118*A*., 225*A*.
thermomagnetic effects, 118*A*.
IRON ALLOYS, corrosion by hydrogen sulphide, 36*A*.
IRON-ALUMINIUM MELTS, solubility of graphite, 52*A*.
IRON-ALUMINIUM-NICKEL ALLOYS :
magnetic properties, effect of cobalt and copper, 66*A*.
properties, 66*A*.
IRON-ALUMINIUM-SILICON DIAGRAM, 199*A*.
IRON-ANTIMONY-COBALT DIAGRAM, 34*A*.
IRON-BERYLLIUM-COBALT SYSTEM, 34*A*.
IRON CARBIDE, heat of formation, 52*A*.
IRON-CARBON DIAGRAM, 152*A*.
IRON-CARBON-SILICON EQUILIBRIA, 52*A*.
IRON-CARBON SYSTEM, vapour pressure, 52*A*.
IRON-CHROMIUM ALLOYS, solubility of nitrogen, 124*A*.
IRON-CHROMIUM-NICKEL ALLOYS, properties, 227*A*.
IRON-COBALT-TANTALUM SYSTEM, 34*A*.
IRON-COPPER-NICKEL ALLOYS, properties, 66*A*.
IRON CRYSTALS :
elasticity modulus, 158*A*.
magnetic viscosity, 29*A*.
magneto-resistance effect, 225*A*.
rigidity modulus, 158*A*.
IRON INDUSTRIES :
France, use of electric power, 89*A*.
Germany, 94*A*., 95*A*.
Hungary, 7*A*.
Italy, 95*A*.
Manchoukuo, 95*A*.
Nevers district, 47*A*.
Russia, 135*A*.
IRON/IRON-CARBIDE DIAGRAM, 152*A*.
IRON-MANGANESE SILICATES, reduction equilibria, 94*A*.
IRON-MOLYBDENUM-NICKEL ALLOYS, corrosion, 73*A*.

IRON-NICKEL ALLOYS :
change of torsional modulus with temperature and magnetisation, 29*A*.
Curie point, effect of pressure, 199*A*.
damping coefficient, effect of magnetisation, 29*A*.
electrical resistance, 225*A*.
IRON ORE :
agglomerating plants, design and operation, 85*A*.
Alabama, differential grinding, 203*A*.
determination of phosphorus, 235*A*.
maganiferous, concentration, 203*A*.
magnetic roasting, 2*A*., 85*A*.
reduction with carbon monoxide, hydrogen and methane, 209*A*.
reduction with carbon monoxide, hydrogen and methane, bibliography, 211*A*.
sintering, 2*A*.
spathic, preparation, 2*A*.
Swedish, crushing and classification, 85*A*.
Swedish, properties, 203*A*.
valuation, Hewitt's method, 45*A*.
IRON ORE DEPOSITS :
India, 84*A*.
New York State, 45*A*.
Salzgitter district, 1*A*.
Sweden, 84*A*.
IRON ORE INDUSTRY, Lake Superior, 45*A*.
IRON ORE WAGONS, corrosion, 191, *Paper*.
IRON - OXIDE/MANGANESE - OXIDE SOLID SOLUTIONS, reduction equilibria, 94*A*.
IRON OXIDES :
determination, 234*A*.
proportion in slag and metal, 182*A*.
IRON PHOSPHATES, reduction, 94*A*.
IRON POWDER, production, 179*A*.
IRON-SILICON MELTS, solubility of graphite, 52*A*.
IRON-VANADIUM ALLOYS, solubility of nitrogen, 124*A*.
ITALY :
blast furnace practice, 45*A*.
iron industry, 95*A*.

JAPAN, introduction of basic process, 100*A*.
JERNKONTORET METHOD OF COUNTING INCLUSIONS, 237*P*.

KATTWINKEL - BAUM - SHIMOMURA APPARATUS for measuring expansion of coal, 176*A*.
KATTWINKEL METHOD, for determining caking index of coal, 176*A*.
KELVIE PROCESS of electrolytic polishing, 113*A*.
KIROV METHOD for manufacture of alloy steel, 214*A*.
KOHLERGAS METHOD of carbonisation, 176*A*.
KOPPERS OVEN for determining swelling of coal, 176*A*.

LAKE SUPERIOR, iron ore industry, 45*A*.
LAPIX, 181*A*.
LARSEN PROCESS of eletrolytic polishing, 113*A*.
LATTICE DISTORTION in deformed iron, 192*A*.
LEAD :
properties at low temperatures, 226*A*.
use for wire drawing, 217*A*.
LEAD-BEARING STEEL :
machinability, 19*A*.
manufacture and properties, 12*A*.
working, health hazards, 110*A*.
LECO CARBON APPARATUS, 182*A*.
LEWIS BOLT AND NUT CO., galvanising plant, 114*A*.
LINDEMUTH CHECKER BRICK, for open-hearth furnaces, 181*A*.
LININGS, blast-furnace, carbon, 44*A*.
LIQUIDUS CURVES, intermetallic compounds, 125*A*.
LOESS COAL-CLEANING PROCESS, 5*A*.
LUBRICANTS :
lead, use for wire drawing, 217*A*.
reclamation, 13*A*.
LUBRICATION :
effect on cylinders, pitting, 28*A*.
rolling mills, 145*A*.
LUNKERITE, 181*A*.
LURGI CARBONISATION PROCESS, 177*A*.
LUXEMBURG, blast-furnace practice, 45*A*.

MACHINABILITY :
cast iron, 119*A*.
crank shafts, effect of gases and oxides, 110*A*.
lead-bearing steel, 19*A*.
MACHINE-TOOL BED, moulding, 49*A*.

MACHINE-TOOL CASTINGS, manufacture, 96*A*.
MACHINE TOOLS, cast iron for, 19*A*., 119*A*.
MACHINING :
chromium - manganese - molybdenum-nickel steel, 110*A*.
metals during heating by induced currents, 186*A*.
stainless steel, 19*A*., 110*A*.
MAGNESIA :
effect in blast furnace slag on furnace operation, 209*A*.
See also Refractory Materials.
MAGNESIUM CHLORIDE, corrosion of metals, 36*A*.
MAGNET STEEL :
nickel-bearing, 66*A*.
production, 224*A*.
properties and applications, 66*A*.
MAGNETIC PROPERTIES :
aluminium-nickel steel, effect of cobalt and copper, 67*A*.
cast iron, 227*A*.
iron-aluminium-nickel alloys, effect of cobalt and copper, 66*A*.
MAGNETIC SEPARATION, coal, 175*A*.
MAGNETIC TESTS, 123*A*., 229*A*.
piston rings, 118*A*.
MAGNETIC VISCOSITY, iron crystals, 29*A*.
MAGNETISATION :
effect on ferromagnetic substances, damping coefficient, 29*A*.
effect on ferromagnetic substances, torsional modulus, 29*A*.
MAGNETO-RESISTANCE EFFECT, iron crystals, 225*A*.
MAGNETOSTRICTION, stress measurement, 26*A*.
MAGNETS, permanent, production, 224*A*., 225*A*.
MAGNITOGORSK WORKS :
rolling-mill plant, 102*A*.
viscosity of blast-furnace slag, 179*A*.
MAIREY CENTRIFUGAL CASTING PROCESS, 9*A*.
MALLEABLE CAST IRON :
effect of elements, 9*A*.
heat treatment, 16*A*., 220*A*.
manufacture, 9*A*.
properties, 162*A*.
tensile tests, 153*A*.
MANCHOUKUO, iron industry, 95*A*.
MANGANESE :
effect in molybdenum steel, creep strength, 160*A*.
effect in steel, 69*A*.
effect in steel, strain-ageing, 199*P*.
MANGANESE (*contd.*)—
effect in steel, strength, 161*A*.
effect in steel sheets, 120*A*.
loss in open-hearth process, 12*A*., 183*A*., 214*A*.
MANGANESE CONCENTRATES, production in Cuba, 45*A*.
MANGANESE ORE, treatment, 84*A*.
MANGANESE ORE DEPOSITS :
Bulgaria, 1*A*.
Cuba, 84*A*.
MANGANESE-SILICON EQUILIBRIUM in molten steel, 52*A*.
MANGANESE STEEL :
diffusion of carbon in austenite, 198*A*.
heating, 141*A*.
properties, 121*A*.
transformations, 124*A*.
MANGANOUS-OXIDE/FERROUS-OXIDE/TITANIUM-DIOXIDE SYSTEM, 72*A*.
MANGANOUS - OXIDE/TITANIUM - DIOXIDE SYSTEM, 72*A*.
MANNESMANN PROCESS of tube manufacture, 13*A*.
MARINO PROCESS of electrolytic polishing, 113*A*.
MAYBACH STRAIN LINES, 155*A*.
MECANO-BUNDY PROCESS for copper-plating tubes, 21*A*.
MEEHANITE, heat treatment, distortion, 184*A*.
MEMBERS, election, 6*P*.
METALLOGRAPHICAL SPECIMENS :
iron-plating, 89, *Paper*.
use of plastics for supporting, 93*P*.
METALLOGRAPHY AND CONSTITUTION, 32*A*., 71*A*., 123*A*., 197*A*., 228*A*.
METALLURGY, use of electricity, 5*A*.
METHANE :
effect on steel during annealing, 59*A*.
reduction of iron ore, 209*A*.
reduction of iron ore, bibliography, 211*A*.
MICROSCOPES, electron, 32*A*.
MICROSCOPICAL EXAMINATION :
iron-plating of specimens, 89, *Paper*.
use of plastics for supporting specimens, 93*P*.
MILK CANS, tinning, 23*A*.
MILL SCALE, use in open-hearth furnaces, 182*A*.
MINERAL RESOURCES, 1*A*., 84*A*., 173*A*.
MINERALS, crushing and classification, 2*A*.

MISHIMA ALLOY, magnetic properties, effect of cobalt and copper, 67*A*.
MOLYBDENUM :
determination in cast iron, 166*A*.
effect in steel, 69*A*.
effect in steel for forgings, 51*A*.
effect in steel, strain-ageing, 199*P*.
effect in steel sheets, 120*A*.
MOLYBDENUM-NICKEL CAST IRON, properties, 30*A*., 162*A*.
MOLYBDENUM-NICKEL STEEL :
heating, 141*A*.
properties at low temperatures, 226*A*.
MOLYBDENUM - SILICON - VANADIUM STEEL, properties, 31*A*.
MOLYBDENUM STEEL :
creep, 160*A*., 226*A*.
creep, effect of manganese, 160*A*.
determination of copper, 167*A*.
effect of vanadium, creep strength, 226*A*.
relaxation tests at high temperatures, 161*A*.
MOLYBDENUM-VANADIUM STEEL, properties, 120*A*.
MONTANA, coal deposits, 1*A*.
MOTOR CASING, moulding, 98*A*.
MOULDING :
automobile parts, 136*A*.
engine cylinders, 49*A*., 98*A*.
hydraulic press casting, 98*A*.
machine-tool bed, 49*A*.
motor casing, 98*A*.
stainless-steel plaque, 136*A*.
wood-working machinery, 49*A*.
MOULDING SAND :
cement-bonded, reclamation, 9*A*.
cooling and storage, 136*A*.
deformation and flowability, 97*A*.
use of coal dust, 137*A*.
MULLITE. *See* Refractory Materials.

NAILS, manufacture, 216*A*.
NATIONAL TUBE CO., electrical machinery, 102*A*.
NATURAL GAS, corrosion of metals, 35*A*.
NERNST EFFECT, 118*A*.
NEVADA, mineral deposits, 1*A*.
NEW SOUTH WALES, coal deposits, 1*A*.
NEW YORK, iron ore deposits, 45*A*.
NICKEL :
change of torsional modulus with temperature and magnetisation, 29*A*.
damping coefficient, effect of magnetisation, 29*A*.
NICKEL (*contd.*)—
effect in steel, 69*A*.
effect in steel for forgings, 51*A*.
effect in steel, strain-ageing, 199*P*.
electrical conductivity, 118*A*.
electrical resistance, 225*A*.
galvanic effects, 118*A*.
properties at low temperatures, 226*A*.
thermal conductivity, 118*A*.
thermomagnetic effects, 118*A*.
NICKEL CAST IRON :
corrosion, 35*A*.
frictional properties, 36*A*.
properties, 69*A*.
NICKEL-COATED SHEETS, welding, 17*A*.
NICKEL COATINGS, corrosion, 163*A*.
NICKEL STEEL :
diffusion of carbon in austenite, 198*A*.
heating, 141*A*.
properties at low temperatures, 226*A*.
NICROSILAL, properties, 162*A*.
NI-HARD, machinability, 119*A*.
NIOBIUM :
determination in cast iron, 166*A*.
effect in chromium-molybdenum-silicon steel, 70*A*.
effect in chromium-molybdenum steel, creep strength, 160*A*.
effect in steel, strain-ageing, 199*P*.
NI-RESIST, properties, 162*A*.
NI-TENSYL :
machinability, 119*A*.
properties, 162*A*.
NITRATES, molten, corrosion of steel, 141, *Paper*.
NITRIDED CASES, hardness tests, sclero-grating method, 277*P*.
NITRIDING :
steel, 104*A*., 149*A*.
tool steel, 149*A*.
NITROGEN :
determination in iron and steel, 76*A*., 77*A*.
effect in chromium iron, 31*A*.
effect on steel during annealing, 59*A*.
effect in steel sheets, blue-brittleness and strain-ageing, 154*A*.
solubility in iron-chromium and iron vanadium alloys, 124*A*.
NON-FERROUS METALS :
effect of elements, 120*A*.
thermal conductivity, 225*A*.
NORFOLK AND WESTERN RAILWAY, heat-treatment and forging plant, 60*A*.

NORMALISING, bars, 149*A*.
NORTH DAKOTA, coal deposits, 1*A*.
NOTCHES :
  effect on metals under deformation at low and high temperatures, 67*A*.
  effect on steel, impact and tensile strength, 223*A*.
  effect on strength of steel, 222*A*., 223*A*.
NUCLEI, formation in liquid state, 33*A*.

OBITUARY NOTICES, deceased members, 285*P*.
OHIO, early stone blast furnace, 135*A*.
OIL, production from coal, Fischer-Tropsch process, 93*A*.
OIL FUEL, use for galvanising kettles, 114*A*.
OIL-HEATER TUBES, use of chromium-molybdenum-silicon steel, 70*A*.
OIL-REFINING PLANT, Wheeling Steel Corporation, 133*A*.
OKLAHOMA, coal deposits, 1*A*.
OPEN-HEARTH FURNACES :
  air–gas ratio, control by oxygen recorders, 182*A*.
  control, 11*A*., 101*A*., 182*A*.
  design, 50*A*.
  doors, stud-tube type, 181*A*.
  gas losses, elimination, 213*A*.
  heat transfer, 50*A*.
  increase of output, 50*A*.
  refractory materials, 3*A*., 131*A*., 181*A*.
  regenerators, cleaning of checkers, 182*A*.
  regenerators, Lindemuth's checker brick, 181*A*.
  roofs, sprung-arch, 44*A*.
  roofs, use of basic bricks, 181*A*.
  tapholes, maintenance, 182*A*.
  temperature measurement of bath, 103*A*.
  use of mill scale, 182*A*.
OPEN-HEARTH PRACTICE, 100*A*., 181*A*.
  basic, 51*A*.
  grain-size control, 51*A*.
  hot-metal requirements, 182*A*.
  Stalin Kuznetskiy Works, 183*A*.
  use of low-silicon pig iron, 182*A*.
  use of scrap, 182*A*.
OPEN-HEARTH PROCESS :
  aluminium additions, 182*A*.
  basic, control of inclusions, 12*A*.
  basic, slag control, 11*A*., 182*A*.
OPEN-HEARTH PROCESS (*contd.*)—
  basic, slag-metal relationship, 53*A*.
  basic, sulphur control, 138*A*.
  carbon elimination, 51*A*., 213*A*.
  duration of boil, 51*A*.
  iron-oxide content of metal, 182*A*.
  manganese loss, 12*A*., 183*A*., 214*A*.
  proportion of iron oxide in slag and metal, 182*A*.
  slag control, 139*A*.
OPEN-HEARTH SLAG, determination of composition, 182*A*.
ORES, mining and treatment, 2*A*., 85*A*., 203*A*.
OTIS STEEL CO. :
  annealing equipment, 60*A*.
  welding of strip, 185*A*.
OVERHEATING, boiler tubes, 164*A*.
OXIDATION :
  cast iron, effect of chromium, 73*A*.
  coal, 92*A*.
OXIDE :
  iron, determination, 234*A*.
  iron, proportion in slag and metal, 182*A*.
  reduction equilibria, 94*A*.
OXYGEN :
  determination in iron and steel, 76*A*., 235*A*.
  effect on steel during annealing, 59*A*.
OXYGEN/HYDROGEN/MOLTEN - IRON SYSTEM, 281*P*.

PAINTS :
  protective, 24*A*.
  surface treatment of steel before application, 191*A*.
PASSIVATING EFFECT of activated carbon on iron, 36*A*.
PEABODY GAS WASHER, 45*A*.
PERRIN PROCESS, 35, *Paper*.
PHOSPHATE-CHROMATE COATINGS, 191*A*.
PHOSPHATE COATINGS, 191*A*.
PHOSPHORIC ACID, corrosion of metals, 36*A*.
PHOSPHORUS :
  determination in iron and steel, 235*A*.
  determination in vanadium steel and ferro-vanadium, 167*A*.
  effect in chromium-molybdenum steel, 70*A*.
  effect in steel, enamelling properties, 23*A*.
PHOTOELASTICITY, measurement of stress, 117*A*., 155*A*.

PICKLING :
De Lattre process, 189*A*.
steel, 113*A*.
PICKLING LIQUOR, disposal, 113*A*.
PICKLING SOLUTIONS, heating, 113*A*.
PIG IRON :
desulphurisation with calcium carbide, 45*A*.
desulphurisation with sodium carbonate, 94*A*.
desulphurisation with sodium silicate, 94*A*.
determination of phosphorus, 235*A*.
low-silicon, manufacture, 178*A*., 181*A*.
low-silicon, use in open-hearth furnace, 182*A*.
PINTSCH CARBONISATION PROCESS, 177*A*.
PIPE MILLS, Bethlehem Steel Co., 146*A*.
PIPES :
centrifugal casting, 9*A*.
corrosion, 200*A*.
galvanising, 115*A*.
PISTON RINGS, magnetic and electrical tests, 118*A*.
PITTING :
cylinders, effect of lubrication, 28*A*.
stainless steel, 126*A*.
PITTSBURGH COAL, hydrogenation, 6*A*.
PLASTICS, for supporting metallographical specimens, 93*P*.
PLATING :
copper, tubes, Mecano-Bundy process, 21*A*.
metallographic specimens, 89, *Paper*.
PLATING SOLUTIONS, heating, 113*A*.
PLUBAMELT PROCESS, 22*A*.
POLISHING :
electrolytic, 32*A*., 112*A*.
electrolytic, Allegheny, Ludlum Steel Corporation process, 113*A*.
electrolytic, Blaut-Lang process, 113*A*., 188*A*.
electrolytic, Burns-Warner process, 113*A*.
electrolytic, Fink-Kenny process, 113*A*.
electrolytic, Kelvie process, 113*A*.
electrolytic, Larsen process, 113*A*.
electrolytic, Marino process, 113*A*.
stainless steel, 188*A*.
POLISHING MACHINE for micro-sections, 32*A*.
POLYCRYSTALLINE MATERIALS, anisotropic behaviour, 193*A*.
POROUS METALS, fatigue, 156*A*.
POTASH/SILICA-GLASS VAPOUR, effect on refractory bricks, 206*A*.
POTASH VAPOUR, effect on refractory bricks, 206*A*.
POTASSIUM-CHLORIDE VAPOUR, action on refractory materials, 87*A*., 206*A*.
POWDER, iron, production, 179*A*.
POWDER METALLURGY, 120*A*.
POWDERED METALS, fatigue, 156*A*.
POWER :
consumption of rolling mills, 58*A*.
requirements of rolling mills, 218*A*.
requirements of strip mills, 102*A*.
PRECIPITATION-HARDENING, copper steel, 193*A*.
PRESSURE, effect on venturi tubes, 161*A*.
PRESSURE VESSELS :
manufacture, 216*A*.
welding, 221*A*.
PRODUCER PRACTICE, 6*A*.
PROOF STRESS, steel, 26*A*.
PULVERISED FUEL. *See* Coal, pulverised.
PUNJAB, iron ore deposits, 84*A*.
PYRIDINE, recovery from coke-oven gas, 91*A*.
PYROMETERS :
optical, two-colour, 147*A*.
testing and calibration, 147*A*.
PYROMETRY, 103*A*., 147*A*.

QUENCHED STEEL, grinding, structural changes, 186*A*.
QUENCHING :
determination of degree, 61*A*.
stepped, high-speed steel, 60*A*.
time-, 220*A*.
QUENCHING OIL, cooling, 106*A*.
QUENCHING TANKS, design, 61*A*.
QUENCHOID, 161*P*.

RAILS :
defects, detection by magnetic means, 123*A*., 229*A*.
welding, 62*A*.
RAILWAY EQUIPMENT, use of alloy cast iron, 30*A*.
RAILWAY MATERIAL, heat treatment and forging, 60*A*.
RAMIX, 181*A*.
REDUCTION EQUILIBRIA, oxides, 94*A*.
REFINING, steel, optimum conditions, 51*A*.

REFRACTORY MATERIALS, 3*A*., 43*A*., 87*A*., 131*A*., 174*A*., 205*A*.
action of potassium-chloride vapour, 87*A*.
effect of alkalis, 206*A*.
expansion, 206*A*.
research in steel works, 43*A*.
use for high-frequency furnaces, 174*A*.
use for open-hearth furnaces, 3*A*., 131*A*., 181*A*.
use for reverberatory furnaces, 44*A*.
use for soaking pits, 44*A*.
REFRACTORY MATERIALS (CHROME-MAGNESITE BRICKS), manufacture, 174*A*.
REFRACTORY MATERIALS (CHROMITE BRICKS), manufacture, 174*A*.
REFRACTORY MATERIALS (FIRE-BRICKS):
manufacture, 174*A*.
wedge type, 87*A*.
REFRACTORY MATERIALS (MAGNESIA):
fused, production, 3*A*.
recrystallisation, 43*A*.
REFRACTORY MATERIALS (MULLITE), properties, 88*A*.
REFRACTORY MATERIALS (SILICA BRICKS):
for coke ovens, 88*A*.
properties, 205*A*.
REFRIGERATORS, corrosion, 37*A*.
REGENERATORS:
cleaning of checkers, 182*A*.
Lindemuth's checker brick, 181*A*.
REHEATING FURNACES:
Broken Hill Proprietary Co., Ltd., 142*A*.
mechanical stoking, 55*A*.
use for billets, 142*A*.
use for slabs, 142*A*.
See also Soaking Pits.
RELAXATION TESTS, steel at high temperatures, 161*A*.
REMANIT-COATED SHEETS, welding, 17*A*.
REPUBLIC STEEL CORPORATION, rolling-mill plant, 102*A*.
RIGHI-LEDUC EFFECT, 118*A*.
RIGIDITY MODULUS, iron crystals, 158*A*.
RIMMING STEEL, manufacture, 52*A*.
RIVETS, manufacture, 216*A*.
ROASTING, magnetic, iron ore, 2*A*., 85*A*.
ROBINS-MESSITER ORE-BEDDING SYSTEM, 45*A*.
ROCK WOOL, manufacture, 47*A*.
ROCKWELL HARDNESS TESTS, British standard method for reading, 27*A*.
ROLLED PRODUCTS, tolerances, 145*A*.
ROLLING-MILL PLANT:
American Rolling Mill Co., 13*A*.
Broken-Hill Proprietary Co., Ltd., 218*A*.
Carnegie-Illinois Steel Corporation, 143*A*.
Magnitogorsk Works, 102*A*.
Republic Steel Corporation, 102*A*.
John Summers & Sons, Ltd., 102*A*.
Tata Iron and Steel Co., 102*A*.
ROLLING-MILL PRACTICE, 13*A*., 58*A*., 102*A*., 145*A*., 218*A*.
ROLLING-MILL TABLES, individual drives, 146*A*.
ROLLING MILLS:
billet, 102*A*.
cogging, 102*A*.
electric driving, 102*A*., 145*A*., 218*A*.
idle edgers, 145*A*.
lubrication, 145*A*.
power consumption, 58*A*.
power requirements, 218*A*.
sheet, 58*A*.
sheet-bar, 102*A*.
slab, 13*A*.
strip, 13*A*., 58*A*.
strip, power requirements, 102*A*.
ROLLS:
casting, 13*A*.
concavity, measurement, 13*A*.
grinding, 187*A*.
temperature control, 13*A*.
ROOFS, sprung-arch, for open-hearth furnaces, 44*A*.
RÖVER FORMULA for calculating stresses in springs, 155*A*.
RUPTURE TESTS, alloy steel at high temperatures, 160*A*.
RUSSIA:
blast-furnace practice, 45*A*.
iron industry, 135*A*.

SALFORD LAYER THICKNESS METER, 115*A*.
SALT BATHS:
corrosion of steel, 141*P*.
metal spraying of containers, 148*P*., 156*P*.
use for case-hardening, 148*A*.
use for hardening, 148*A*., 219*A*.
SALTS, molten, attack on steel, 200*A*.
SALZGITTER DISTRICT, iron ore deposits, 1*A*.

SCALING :
iron, blister formation, 15*A*.
iron alloys, effect of hydrogen sulphide, 36*A*.
steel, 55*A*.
steel, bibliography, 55*A*.
SCARFING, billets, 20*A*., 112*A*., 188*A*.
SCLERO-GRATING METHOD of hardness testing, 277*P*.
SCRAP, use in open-hearth practice, 182*A*.
SCREENING, coke, 133*A*.
SCREWS, manufacture, 216*A*.
SEA WATER, corrosion of steel, 126*A*.
SEIZURE, lubricated balls, 157*A*.
SHEAR TESTS, 25*A*.
SHEARING, steel, 218*A*.
SHEET-BAR MILLS, 102*A*.
SHEET MILLS, 58*A*.
SHEETS :
blue-brittleness, effect of nitrogen, 154*A*.
coated, welding, 17*A*.
effect of elements, 120*A*.
galvanising, 115*A*.
heat-treatment furnaces, 106*A*.
sticking, 140*A*.
strain-ageing, effect of nitrogen, 154*A*.
welding, 108*A*.
SHEFFIELD MEETING, proceedings, 1*P*.
SHIP CONSTRUCTION, use of high-tensile steel, 31*A*.
SHIPS, corrosion, electrolytic, 38*A*., 73*A*.
SHORTER PROCESS, 148*A*., 149*A*., 219*A*.
SICROMAL-COATED SHEETS, welding, 17*A*.
SILAL, machinability, 119*A*.
SILICA, determination in slag, 168*A*.
SILICA BRICKS. *See* Refractory Materials.
SILICATE MELTS, electrodeposition of iron, 53*A*.
SILICO-MANGANESE, deoxidation of steel, 11*A*.
SILICO-ORGANIC COMPOUNDS, use for protective films, 23*A*.
SILICON :
determination in iron and steel, 75*A*.
effect in chromium-molybdenum steel, creep strength, 160*A*.
effect in steel, strength, 161*A*.
transfer from welding rod to cast iron, 107*A*.
SILICON CAST IRON, properties, 30*A*.
SILICON IRON, crystal orientation, 72*A*.
SILVER, effect in chromium-nickel steel, corrosion, 73*A*.
SILVER-COATED SHEETS, welding, 17*A*.
SIMPLEX GAS WASHER, 46*A*.
SINGHBHUM, chromite deposits, 173*A*.
SINTERING, iron ore, 2*A*.
SLAB MILLS, 13*A*.
electric driving, 145*A*.
SLABS, reheating furnaces, 142*A*.
SLAG :
blast-furnace. *See* Blast-Furnace Slag.
control in basic open-hearth process, 11*A*., 182*A*.
control in open-hearth process, 139*A*.
determination of silica, 168*A*.
open-hearth, determination of composition, 182*A*.
SLAG-METAL RELATIONSHIP, basic open-hearth process, 53*A*.
SLAG SYSTEMS, 211*A*.
SLAG WOOL, manufacture, 47*A*.
SLIP PHENOMENON, 193*A*.
SLIVERS, in cold-rolled strip, 58*A*., 145*A*.
SMELTING, chrome ores in electric furnace, 211*A*.
SMOOTHNESS-METER, 188*A*.
SOAKING-PIT PRACTICE, 182*A*.
effect on surface quality of blooms, 141*A*.
SOAKING PITS :
fuel control, 141*A*.
refractory materials, 44*A*.
See also Reheating Furnaces.
SOCIÉTÉ DES CHARBONNAGES DE FAULQUEMONT, coal-cleaning plant, 5*A*.
SOCIETY OF AUTOMOTIVE ENGINEERS, method for classification of ingots, 124*A*.
SODIUM CARBONATE, desulphurisation of pig iron, 94*A*.
SODIUM-CHLORIDE VAPOUR, effect on refractory bricks, 206*A*.
SODIUM HYDROXIDE, corrosion of metals, 36*A*.
SODIUM SILICATE, desulphurisation of pig iron, 94*A*.
SOLIDIFICATION, steel castings, 10*A*.
SOUTH AFRICA, blast-furnace practice, 13, *Paper*.
SOUTH AFRICAN IRON AND STEEL INDUSTRIAL CORP., blast-furnace plant, 13*P*.
SPATHIC ORE, preparation, 2*A*.
SPECIFIC HEAT, cast iron, 227*A*.

SPECIFICATIONS :
electric arc welding, British, 62*A*.
steel castings, British, 196*A*.
stress-relief of cast iron, French, 16*A*.
SPECTRUM ANALYSIS, steel, 77*A*., 167*A*., 235*A*.
SPHEROIDISING, steel, 61*A*.
SPRAYING :
aluminium, 114*A*.
metals, 190*A*.
metals on axles, effect on fatigue strength, 156*A*.
metals on salt-bath containers, 148*P*., 156*P*.
SPRINGS :
helical, stresses, 155*A*.
helical, stresses, effect of wire curvature, 155*A*.
STAINLESS STEEL :
carburisation, 104*A*.
cleaning, 20*A*.
corrosion in chloride salt solutions, 73*A*.
corrosion in hydrochloric acid, 73*A*.
free-cutting, 31*A*.
heating, 141*A*.
impact tests at low temperatures, 68*A*.
machining, 19*A*., 110*A*.
pitting, 126*A*.
polishing, 188*A*.
properties, 69*A*.
torsion tests at high temperatures, 26*A*.
use for aircraft construction, 70*A*., 216*A*., 221*A*.
use for chemical equipment, 69*A*.
STAINLESS-STEEL PLAQUE, moulding and casting, 136*A*.
STAINLESS-STEEL STRIP, manufacture, 102*A*.
STAINLESS-STEEL WIRE, manufacture, 57*A*.
STALIN KUZNETSKIY WORKS, open-hearth practice, 183*A*.
STANTON IRON CO., LTD., centrifugal casting practice, 9*A*.
STATIC-CRACK STRENGTH, metals, 222*A*., 223*A*.
STEEL :
action of hydrogen sulphide, 142*A*.
action of sulphur dioxide, 142*A*.
ageing, bibliography, 118*A*.
alloy, creep, 161*A*.
alloy, defects, effect of soaking-pit practice, 141*A*.
alloy, elastic modulus, temperature coefficient, 25*A*.
STEEL (*contd.*)—
alloy, impact tests at low temperatures, 68*A*.
alloy, manufacture, 138*A*.
alloy, manufacture in electric furnaces, Kirov method, 214*A*.
alloy, rupture tests at high temperatures, 160*A*.
alloy, thermal conductivity, 225*A*.
annealing, effect of gases, 59*A*.
carburisation, 148*A*.
case-hardening, 184*A*.
castings. *See* Castings.
clad, flame cutting, 221*A*.
classification, thermo-electric method, 122*A*.
cohesive strength, 222*A*., 223*A*.
cold-brittleness, 118*A*.
composite, manufacture, Pluramelt process, 22*A*.
composition, control, 122*A*.
corrosion, 191*P*.
corrosion in alkalies, 36*A*.
corrosion by molten nitrates, 141, *Paper*.
corrosion in sea-water, 126*A*.
corrosion-fatigue, effect of protective coatings, 164*A*.
corrosion-resistant, properties, 31*A*.
creep, effect of composition, 30*A*.
crystallisation, primary, 33*A*.
cutting, 18*A*., 109*A*.
de-enamelling, 24*A*.
deep-drawing, 143*A*.
deep-drawing, spot welding, 62*A*.
deep-drawing properties, effect of tin, 56*A*.
deoxidation with silico-manganese, 11*A*.
dephosphorisation, Perrin process, 35*P*.
die, hardening, 105*A*.
die, properties, 31*A*.
diffusion of hydrogen, 68*A*.
drawing, effect of annealing, 15*A*.
effect of elements, 69*A*., 120*A*.
embrittlement, effect of cold work, 65*A*.
embrittlement at high temperatures, 226*A*.
enamelling properties, effect of phosphorus, 23*A*.
fatigue, 65*A*.
fatigue strength, recovery by annealing, 224*A*.
grain-size, 71*A*.
grain-size, determination, 197*A*.
grain-size, effect of annealing, 15*A*.
grain-size, effect of welding current, 107*A*.

STEEL (*contd.*)—
Grainal treated, properties, 157*A*.
hardenability, effect of grain-size, 157*A*.
hardness, effect of repeated stress and ageing, 29*A*.
hardness in the stressed state, 193*A*.
heat-resistant, properties, 31*A*.
heat treatment, structural changes, 105*A*.
heating, 141*A*.
high-tensile, properties, 119*A*.
high-tensile, use for ship construction, 31*A*.
impact strength, effect of notches, holes and cracks, 223*A*.
impact tests at low temperatures, 67*A*., 68*A*.
inclusions, grain boundary, 33*A*.
lead-bearing, machinability, 19*A*.
lead-bearing, manufacture and properties, 12*A*.
lead-bearing, working, health hazards, 110*A*.
low-carbon, yield point, 154*A*.
magnet, nickel-bearing, 66*A*.
magnet, properties and applications, 66*A*.
manganese-silicon equilibrium, 52*A*.
molten, temperature measurement, 103*A*.
nitriding, 104*A*., 149*A*.
quenched, grinding, structural changes, 186*A*.
pickling, 113*A*.
production, 11*A*., 50*A*., 100*A*., 138*A*., 181*A*., 213*A*.
production in high frequency furnace, 139*A*.
production, Perrin process, 35, *Paper*.
proof stress, 26*A*.
refining, optimum conditions, 51*A*.
relaxation tests at high temperatures, 161*A*.
rimming, manufacture, 52*A*.
rolled, tensile strength, 153*A*.
scaling, 55*A*.
scaling, bibliography, 55*A*.
shearing, 218*A*.
spheroidising, 61*A*.
strain-ageing, effect of crystal size, 213*P*.
strain-ageing and yield point, effect of elements, 199 *Paper*.
strength, effect of elements, 161*A*.
structural changes during tensile test, 153*A*.
STEEL (*contd.*)—
structure, effect of welding current, 107*A*.
surface treatment before painting, 191*A*.
tensile strength, effect of notches, holes and cracks, 223*A*.
tensile strength, effect of zirconium, 154*A*.
tensile tests, non-uniform yielding, 25*A*.
torsion tests at high temperatures, 26*A*.
torsional strength, 223*A*.
transformer, winding round coils, 158*A*.
undercooling capacity, 33*A*.
use for aircraft construction, 227*A*.
wear, effect of atmospheres, 28*A*.
STEEL PLANTS :
American Rolling Mill Co., 11*A*.
Andrews Steel Co., 11*A*.
Australian Iron & Steel, Ltd., 100*A*.
Blaenavon Co., Ltd., 100*A*.
Copperweld Steel Co., 138*A*., 213*A*.
Fagersta Works, 100*A*.
Vanadium-Alloys Steel Co., 213*A*.
STEWARTS AND LLOYDS, LTD., blast-furnace plant, 45*A*.
STIEFEL PROCESS of tube manufacture, 13*A*.
STOKING, mechanical, reheating furnaces, 55*A*.
STOVES, hot blast. *See* Blast-Furnace Stoves.
STRAIGHTENING, hardened parts, 220*A*.
STRAIN-AGEING :
sheets, effect of nitrogen, 154*A*.
steel, effect of crystal size, 213*P*.
steel, effect of elements, 199, *Paper*.
STRAIN GAUGE, 154*A*.
STRAIN LINES, Maybach, 155*A*.
STRAINS, impact, measurement, 65*A*.
STRESS-RELIEF :
cast iron, French specification, 16*A*.
castings, 59*A*.
welded joints, 60*A*.
STRESS-STRAIN DIAGRAMS, 214*P*.
STRESSES :
combined tensile and torsional, deformation of bars, 155*A*.
effect on steel, hardness, 193*A*.
in chromium steel cylinders, 26*A*.
in helical springs, 155*A*.
in helical springs, effect of wire curvature, 155*A*.
measurement, graphical method, 192*A*.

STRESSES (*contd.*)—
measurement, magnetostriction, 26*A*.
measurement, Maybach strain lines, 155*A*.
measurement, photoelastic method, 117*A*., 155*A*.
repeated, effect on hardness changes, 29*A*.
STRIP :
annealing, 60*A*.
cold rolled, slivers, 58*A*., 145*A*.
electro-tinning, 22*A*.
heat-treatment furnaces, 106*A*.
stainless steel, manufacture, 102*A*.
welding, 185*A*.
STRIP MILLS, 13*A*., 58*A*.
electric driving, 102*A*.
power requirements, 102*A*.
STRUCTURAL DAMAGE, metals, 65*A*.
STRUCTURE :
cementite, 95, *Paper*.
crystalline, effect on metals, 192*A*.
steel, changes during heat treatment, 105*A*.
steel, changes during tensile test, 153*A*.
steel, effect of welding current, 107*A*.
wire, control by magnetic means, 194*A*.
SULPHUR :
control in basic open-hearth process, 138*A*.
determination in cast iron, 75*A*.
determination in coal and coke, 168*A*.
SULPHUR DIOXIDE, action on steel, 142*A*.
SULPHURIC ACID, corrosion of metals, 36*A*.
SULPHUROUS ACID, corrosion of metals, 36*A*.
SUMMERS, JOHN & SONS, LTD., rolling-mill plant, 102*A*.
SURFACE-FINISH, metals, 188*A*.
SURFACING, hard, 62*A*.
SWEDEN :
fuel economy at steelworks, 4*A*.
iron ore deposits, 84*A*.
iron ore statistics, 85*A*.
SWEDISH IRON ORE, properties, 203*A*.
SWEDISH ORE, crushing and classification, 85*A*.
SWELLING :
coal, 90*A*.
coal, Koppers oven for determining, 176*A*.
TANKS :
cathodic protection, 231*A*.
galvanised, corrosion, pin hole, 37*A*.
TANTALUM, determination in cast iron, 166*A*.
TAP-HOLES :
clay gun for, 178*A*.
maintenance, 182*A*.
TATA IRON AND STEEL CO., LTD. :
blast-furnace plant, 178*A*.
coking plant, 207*A*.
operation of Perrin process, 35, *Paper*.
rolling-mill plant, 102*A*.
TEARS in steel castings, 180*A*.
TEMPERATURE COEFFICIENT, elastic modulus, 25*A*.
TEMPERATURES :
distribution in welding, 221*A*.
effect on cast iron, tensile strength, 25*A*.
effect on torsional modulus of ferromagnetic substances, 29*A*.
effect on venturi tubes, 161*A*.
high, behaviour of turbine parts, 161*A*.
high, effect of notches on deformation of metals, 67*A*.
high, embrittlement of steel, 226*A*.
high, properties of coke, 92*A*.
high, relaxation tests of steel, 161*A*.
high, rupture tests of alloy steel, 160*A*.
high, tensile tests of cast iron, 195*A*.
high, tensile tests of copper, 160*A*.
high, torsion tests of steel, 26*A*.
low, effect of notches on deformation of metals, 67*A*.
low, impact tests of steel, 67*A*., 68*A*.
low, properties of chromium-molybdenum-nickel steel, 227*A*.
low, properties of chromium-molybdenum steel, 226*A*.
low, properties of chromium-molybdenum-vanadium steel, 227*A*.
low, properties of copper, 226*A*.
low, properties of iron, 226*A*.
low, properties of lead, 226*A*.
low, properties of molybdenum-nickel-steel, 226*A*.
low, properties of nickel, 226*A*.
low, properties of nickel steel, 226*A*.
measurement, 147*A*.
measurement, molten steel, 103*A*.

TEMPERING :
cast iron, graphite absorption, 16*A*.
tool steel, dimensional changes, 150*A*.
TENSILE-FATIGUE TESTING MACHINE for small-diameter wire, 156*A*.
TENSILE STRENGTH :
cast iron, effect of temperature, 25*A*.
rolled carbon steel, 153*A*.
steel, effect of notches, holes and cracks, 223*A*.
steel, effect of zirconium, 154*A*.
TENSILE TESTS, 25*A*., 64*A*., 120*A*., 153*A*.
cast iron at high temperatures, 195*A*.
copper at high temperatures, 160*A*.
malleable cast iron, 153*A*.
non-uniform yielding of metals, 25*A*.
structural changes of materials, 153*A*.
TEST-PIECES :
for steel castings, 120*A*.
impact, cylindrical, 117*A*.
TESTING MACHINES :
fatigue, 156*A*.
fatigue, for small-diameter wire. 156*A*.
hardness, pendulum, 27*A*.
TESTS :
bend, 25*A*., 64*A*.
bend, weld metal, 26*A*.
compression, 25*A*.
corrosion, accelerated spray, 165, *Paper*.
creep, 120*A*.
creep, interpretation of results, 160*A*.
creep, maintenance of load, 159*A*.
creep-torsion, 30*A*.
cupping, 25*A*.
drill, 111*A*.
drill, Beeny's, 19*A*.
electrical, piston rings, 118*A*.
fatigue, 120*A*.
fatigue, turbine blades, 193*A*.
fatigue, welded joints, 108*A*.
flowability, moulding sand, 97*A*.
hardness, 25*A*.
hardness, Rockwell, British Standard method of reading, 27*A*.
hardness, sclero-grating method, 277*P*.
hardness, sources of error, 27*A*.
impact, 25*A*., 117*A*.
impact, steel at low temperatures, 67*A*., 68*A*.
magnetic, 123*A*., 229*A*.
TESTS (*contd.*)—
magnetic, piston rings, 118*A*.
relaxation, steel at high temperatures, 161*A*.
rupture, alloy steel at high temperatures, 160*A*.
shear, 25*A*.
tensile, 25*A*., 64*A*., 120*A*., 153*A*.
tensile, cast iron at high temperatures, 195*A*.
tensile, copper at high temperatures, 160*A*.
tensile, malleable cast iron, 153*A*.
tensile, non-uniform yielding of metals, 25*A*.
tensile, structural changes of materials, 153*A*.
torsion, 25*A*.
torsion, steel at high temperatures, 26*A*.
wear, 25*A*.
welded joints, British Standard methods, 109*A*.
THERLUMIT, 181*A*.
THERMAL CONDUCTIVITY :
cast iron, 227*A*.
iron and nickel, 118*A*.
iron and steel, 225*A*.
THERMAL EXPANSION :
cast iron, 227*A*.
chromium-vanadium steel, 30*A*.
THERMOCOUPLES, base-metal, stability in air, 147*A*.
THERMO-ELECTRIC METHOD for classifying steel, 122*A*.
THERMOMAGNETIC EFFECTS, iron and nickel, 118*A*.
THERMOMETERS, 147*A*.
THOMAS, RICHARD & CO., LTD., blast-furnace plant, 45*A*.
TIMKEN ROLLER BEARING CO., photo-elastic equipment, 117*A*.
TIN :
determination in cast iron, 166*A*.
effect in steel, deep-drawing properties, 56*A*.
residual, in steel, 56*A*.
TIN COATINGS, thickness measurement, 115*A*., 116*A*.
TIN CONTAINERS, corrosion, 232*A*.
TINNING :
electro-, strip, 22*A*.
metal parts, 115*A*., 190*A*.
milk cans, 23*A*.
TINPLATE, manufacture, 22*A*.
TITANIUM :
determination, 166*A*.
determination in cast iron, 166*A*.
effect in chromium-molybdenum-silicon steel, 70*A*.

TITANIUM (*contd.*)—
effect in chromium-molybdenum steel, creep strength, 160*A*.
effect in steel, strain-ageing, 199*P*.
in blast-furnace hearths, 208*A*.
separation from vanadium, 166*A*.
TOLERANCES, rolled products, 145*A*.
TOOL STEEL :
annealing, 15*A*.
forging, 216*A*.
hardening, dimensional changes, 150*A*.
heat treatment, 60*A*.
manufacture, 12*A*, 213*A*.
nitriding, 149*A*.
properties, 120*A*.
toughness, 64*A*.
wear, 157*A*.
TOOLS, cast iron for, 19*A*.
TORSION TESTS, 25*A*.
steel at high temperatures, 26*A*.
TORSIONAL-FATIGUE TESTING MACHINE, 156*A*.
TORSIONAL MODULUS, ferromagnetic substances, change with temperature and magnetisation, 29*A*.
TORSIONAL STRENGTH, steel of different sections, 223*A*.
TOUGHNESS, tool steel, 64*A*.
TRANSFER CARS, for ingots, 101*A*.
TRANSFORMATIONS :
chromium steel, effect of cooling rate, 34*A*.
manganese steel, 124*A*.
TRANSFORMER STEEL, winding round coils, 158*A*.
TUBERCULATION, pipes, 200*A*.
TUBES :
boiler, failure due to overheating, 164*A*.
brazing, 151*A*.
chromium-molybdenum steel, welding, 17*A*.
copper clad, 22*A*.
copper plating, Mecano-Bundy process, 21*A*.
heat-treatment furnaces, 220*A*.
oil-heater, use of chromium-molybdenum-silicon steel, 70*A*.
seamless, manufacture, Mannesmann process, 13*A*.
seamless, manufacture, Stiefel process, 13*A*.
seamless, manufacture, Wellman process, 13*A*.
venturi, effect of temperature and pressure, 161*A*.
welded, manufacture, Fretz-Moon process, 13*A*., 146*A*.
TUBES (*contd.*)—
welding, 17*A*.
TUNGSTEN :
determination, 75*A*.
determination in cast iron, 166*A*.
effect in steel, 69*A*.
effect in steel sheets, 120*A*.
TUNGSTEN STEEL, heat treatment, 105*A*.
TURBINE BLADES, fatigue tests, 193*A*.
TURBINE PARTS, behaviour at high temperatures, 161*A*.
TURBO-BLOWERS, design, 208*A*.
TYRES, heat treatment, 106*A*.

UNDERCOOLING CAPACITY, steel, 33*A*.
UNITED KINGDOM :
blast-furnace practice, 45*A*.
specification for arc welding, 62*A*.
specifications for steel castings, 196*A*.
war economy, 47*A*.
UNITED STATES :
coal deposits, 1*A*.
early stone blast-furnace, 135*A*.
electric power for steel plants, 4*A*.
iron ore deposits, 45*A*.
steel foundry industry, 48*A*.
steel industry for Pacific coast, 8*A*.
UNITED STATES STEEL CORPORATION, electrical machinery, 102*A*.
UNITED STEEL COMPANIES, LTD., research department, 70*A*.

VALUATION, iron ore, Hewitt's method, 45*A*.
VALVES :
extrusion, 143*A*.
oxygen-reducing, burning-out, 18*A*.
VANADIUM :
effect in molybdenum steel, creep strength, 226*A*.
effect in steel for forgings, 51*A*.
effect in steel, strain-ageing, 199*P*.
separation of titanium, 166*A*.
VANADIUM-ALLOYS STEEL CO., plant, 213*A*.
VANADIUM STEEL :
determination of phosphorus, 167*A*.
manufacture, 213*A*.
VAPOUR PRESSURE, iron-carbon system, 52*A*.
VENTILATING EQUIPMENT for electrical machinery, 102*A*.
VENTURI TUBES, effect of temperature and pressure, 161*A*.
VISCOSITY, blast furnace slag, 179*A*.

VOGT AND PERKINS FORMULA, for calculating stresses in springs, 156*A*.

WAGONS, iron ore, corrosion, 191, *Paper*.
WAHL FORMULA, for calculating stresses in springs, 156*A*.
WASTE-HEAT, utilisation, 207*A*.
WASTE MATERIAL, use in iron industry, 135*A*.
WATER, corrosiveness, measurement, 163*A*.
WATER VAPOUR, effect on steel during annealing, 59*A*.
WEAR :
  balls in grinding mills, 86*A*.
  cast iron, 28*A*., 119*A*.
  mechanism, crystallographic point of view, 28*A*.
  metals, 27*A*., 28*A*., 120*A*., 157*A*.
  steel, effect of atmospheres, 28*A*.
  tool steel, 157*A*.
WEAR TESTS, 25*A*.
WELD METAL :
  bend tests, 26*A*.
  grain-size, effect of electrode coatings, 18*A*.
WELDED BUILDINGS, 108*A*.
WELDED JOINTS :
  fatigue tests, 108*A*.
  stress relief, 60*A*.
  tests, British Standard methods, 109*A*.
WELDING :
  aircraft parts, 221*A*.
  atomic hydrogen, 185*A*.
  bronze-, iron castings, 108*A*.
  cast iron, 107*A*., 151*A*., 185*A*.
  cast iron, retention of silicon from welding rod, 107*A*.
  chemical plant, 63*A*.
  chromium-molybdenum steel tubes, 17*A*.
  coated sheets, 17*A*.
  coke-oven equipment, 18*A*.
  cylinders, 63*A*.
  electric arc, calculation of weight and number of electrodes, 17*A*.
  electric arc, specification, British, 62*A*.
  electric resistance, 62*A*.
  electric resistance, effect of current on grain-size and structure of metal, 107*A*.
  galvanised sheets, 108*A*.
  gears, stress control, 108*A*.
  pressure vessels, 221*A*.
WELDING (*contd.*)—
  rails, 62*A*.
  sheets, 108*A*.
  spot, 17*A*.
  spot, deep-drawing steel, 62*A*.
  spot, effect of current on grain-size and structure of metal, 107*A*.
  strip, 185*A*.
  substitution for casting, 18*A*.
  temperature distribution, 221*A*.
  tubes, 17*A*.
  use of "resting" electrode, 185*A*.
WELDING CRACKS, in steel, 108*A*.
WELDING ELECTRODES :
  calculation of weight and number required, 17*A*.
  coating thickness, 107*A*.
  coatings, effect on grain-size of weld metal, 18*A*.
WELDING MACHINES, spot, 151*A*.
WELDING RODS :
  character, effect on properties of weld, 152*A*.
  character, effect on properties of weld, bibliography, 152*A*.
WELDING TERMS, definition, 109*A*.
WELDS :
  defects, 152*A*.
  properties, effect of welding rod, 152*A*.
  properties, effect of welding rod, bibliography, 152*A*.
WELLMAN PROCESS of tube manufacture, 13*A*.
WEST MICHIGAN STEEL FOUNDRY CO., foundry plant, 136*A*.
WESTERN AUSTRALIA, constitution of coal, 132*A*.
WHEELABRATOR, 187*A*.
WHEELING STEEL CORPORATION :
  galvanising plant, 115*A*.
  oil-refining plant, 133*A*.
WIRE :
  barbed, manufacture, 216*A*.
  control of structure by magnetic means, 194*A*.
  galvanising, 22*A*.
  small-diameter, tensile-fatigue testing machine, 156*A*.
  stainless steel, manufacture, 57*A*.
WIRE DRAWING :
  reactive, 56*A*., 143*A*., 144*A*.
  use of lead as lubricant, 217*A*.
WIRE-DRAWING INDUSTRY, Belgian, 216*A*.
WIRE NETTING, manufacture, 216*A*.
WIRE ROD, baking, 144*A*.
WOOD-WORKING MACHINERY, moulding, 49*A*.

WOOL, mineral, manufacture, 47*A*.
WYOMING COAL, coking properties, 175*A*.

X-RAY EXAMINATION :
arrangement of filter, 197*A*.
steel, maximum penetration, 32*A*.

YIELD POINT :
low-carbon steel, 154*A*.
steel, effect of elements, 199, *Paper*.
YIELDING, plastic, ductile metals, 66*A*.

ZAPOROZHSTAL WORKS, blast-furnace practice, 178*A*.
ZINC :
deformation, effect of notches, 67*A*.
separation from iron by hydrogen sulphide, 77*A*.
ZINC-BEARING MATERIAL, smelting in blast furnace, 7*A*.
ZINC-CHROMIUM COATINGS, corrosion, 39*A*.
ZINC COATINGS, corrosion, 39*A*.
ZIRCONIUM :
determination in cast iron, 166*A*.
effect in steel, tensile strength, 154*A*.

NAME INDEX.

ABRESCH, K., determination of nitrogen, 77*A*.
ADAMOVICH, L. P., determination of aluminium in steel, 167*A*.
ADAMS, J., elected Member, 6*P*.
AITCHISON, R. B., oxy-acetylene cutting of chromium-steel castings, 109*A*.
AKIMOV, G. V., classification of steel by thermo-electric method, 122*A*.
AKULOV, N. S., thickness measurement of protective coatings, 116*A*.
ALEKSEEV, G. I., corrosion of heat-treatment pots, 200*A*.
ALESCHAND, C. W., machining of stainless steel, 19*A*.
ALLAN, G. H., elected Member, 6*P*.
ALLEN, R. M., silicon recovery in welding of cast iron, 107*A*.
ALLISON, J., forgings for aircraft, 143*A*.
ALTENBURGER, C. L., effect of nitrogen on drawability of steel, 154*A*.
ALTON, E., silica bricks, 88*A*.
AL'TSHULER, L. V., effect of grinding on structure of quenched steel, 186*A*.
AMBERG, K., grinding metallographic specimens, 32*A*.
AMEEN, E., dimensional changes of steel during quenching, 150*A*.
ANDERSON, R. O., elected Associate, 9*P*.
ANDREW, J. H., age-hardening and yield-point of steel, 223*P*.
ANDREWS, A. I., enamels for cast iron, 116*A*.
ANDREWS, D. A.:
coal in Montana, 1*A*.
coal in North Dakota, 1*A*.
ANTIA, D. P., elected Member, 6*P*.
APPLEYARD, K. C., oil from coal, 93*A*.
AREND, H., proof stress, 26*A*.
ARKHANGEL'SKAYA, Z. N., grain size of high-speed steel, 197*A*.
ARMITAGE, W., elected Member, 6*P*.
ARMOUR, A. M., detection of defects by magnetic means, 123*A*.
ARNOLD, G. M., gas-mixing systems, 89*A*.
ARNOLD, T. H., elected Member, 7*P*.
ASAKURA, K., abrasion of metals, 28*A*.
ASHCROFT, W., carbon steel, 195*A*.
ASIMOW, M., quenching charts, 61*A*.
ASKINAZI, B. M., machining of metals, 186*A*.
ATERMAN, M., elected Member, 7*P*.
ATHAVALE, G. T., caustic embrittlement of boiler plate, 37*A*.
ATKINS, M., elected Member, 7*P*.
AUBURN, B. J., rolling-mill drives of Carnegie-Illinois Steel Corporation, 145*A*.
AUGSBURGER, D., heating of pickling solutions, 113*A*.
AUSTIN, C. R., creep of stainless steel, 159*A*.
AUSTIN, H. S., testing of core oils, 137*A*.

BABAT, G. I., machining of metals, 186*A*.
BABCOCK, D. E.:
effect of character of welding rod on properties of welds, 152*A*.
welding, 107*A*.
BAILEY, R. W., plastic yielding and fatigue, 66*A*.
BALLARD, W. E.:
metal spraying, 190*A*.
metal-spraying of salt-bath containers, 156*P*.
BALLAY, M., nickel-molybdenum cast iron, 30*A*.
BAL'SHIN, M. YU., bearing metal from iron powder, 179*A*.
BANSEN, H., Krupp-Renn direct process, 95*A*.
BARDENHEUER, P.:
crystallisation of steel, 33*A*.
manganese loss in open-hearth process, 12*A*, 183*A*, 214*A*.
BARDGETT, W. E., testing equipment of United Steel Companies, Ltd., 70*A*.
BARTELLS, G. C., corrosion of galvanised tanks, 37*A*.

BARTHOLOMEW, E. L., heat treatment of cast iron, 219*A*.
BASHFORTH, G. R., electric furnaces, 101*A*.
BASSETT, W. V., measurement of impact strains by extensometer, 65*A*.
BATCHELLOR, H. G., Pluramelt process, 22*A*.
BATE, N. H., elected Associate, 9*P*.
BATTERSBY, G. W., self-sealing doors for coke ovens, 5*A*.
BAUKLOH, W.:
effect of hydrogen sulphide on iron, 36*A*.
scaling of metals, 15*A*.
BAVISTER, H. S., evaluation of inclusions, 273*P*.
BECKER, G., iron-cobalt-tantalum system, 34*A*.
BEENY, H. H., cutting fluids, 111*A*.
BEET, A. E., determination of sulphur and chlorine in coal and coke, 168*A*.
BEGEMAN, M. L., hard surfacing, 62*A*.
BELCHER, R.:
determination of carbon in coal, 237*A*.
determination of sulphur and chlorine in coal and coke, 168*A*.
BELLIAN, N. G., elected Member, 7*P*.
BENEDICKS, C., reply to discussion on Ljunggren's paper, 277*P*.
BENNETT, B., elected Associate, 9*P*.
BENNETT, J. F., temperature measuring instruments, 147*A*.
BENNINGER, H. H., effect of coatings on corrosion-fatigue of steel, 164*A*.
BENZ, W. G., creep of alloy steels, 159*A*.
BERGLUND, T., grinding of metallographic specimens, 228*A*.
BERGSTRÖM, H., charcoal manufacture, 207*A*.
BERK, detection of caustic embrittlement, 232*A*.
BERNER, L. R., hot metal requirements for open-hearth practice, 182*A*.
BERTHELOT, C.:
coal washing, 5*A*.
electric power in iron industry, 89*A*.
BERTHOLD, R., X-ray examination of steel, 32*A*.
BEST, F., obituary notice, 294*P*.
BHADAURIA, B. S., chromite in India, 173*A*.
BIANCHI, P., elected Member, 7*P*.
BIERS, H., deoxidisers, 11*A*.
BILLINGSLEY, C., seamless tubes, 13*A*.
BINDER, W. O., effect of low-temperature heat treatment on elastic properties of stainless steel, 195*A*.
BINNIE, D.:
evaluation of inclusions, 266*P*.
strain-ageing of steel, 228*P*.
BIRGE, G. W., carbonisation of coal, 6*A*.
BISCHOF, W., structural steel, 26*A*.
BLACKWELL, W. T., elected Associate, 9*P*.
BLAINEY, A., metallographic polishing machine, 32*A*.
BLECKLY, R. S., elected Member, 7*P*.
BLECKMANN, R., crystallisation of steel, 33*A*.
BLUM, W., corrosion tests on metallic coatings, 163*A*.
BLUMBERG, H., Pluramelt process, 22*A*.
BOALER, E., elected Member, 7*P*.
BOARDMAN, H. C., flame cutting, 221*A*.
BOAS, W., crystalline structure of metals, 192*A*.
BOCHENEK, B., cracks in welded steel, 108*A*.
BÖHM, E., passivating effect of activated carbon, 36*A*.
BOHO, M. J.:
control of open-hearth furnaces, 182*A*.
control of soaking pits, 141*A*.
BOLSOVER, G. R., evaluation of inclusions, 263*P*.
BOOTH, J. C., elected Member, 7*P*.
BORGAT, J. B., welding of tubes, 17*A*.
BOSBYSHELL, J. H., corrosion of metals, 35*A*.
BOTTENBERG, W., coreless induction furnaces, 139*A*.
BOURGGRAFF, R., scaling of steel, 55*A*.
BOUTTÉ, A., welding of chromium-molybdenum steel tubes, 17*A*.
BOWLES, K. W., hydrogenation of coal, 93*A*.
BOYLE, W. P., straightening of hardened parts, 220*A*.
BRADBURY, F. R., determination of iron, 166*A*.
BRALEY, S. A., effect of character of welding rod on properties of welds, 152*A*.
BRAND, H. M., elected Member, 7*P*.
BRASSERT, H. A., European iron and steel industry, 45*A*.

BRAUN, M. P., molybdenum-vanadium steel, 120*A*.
BRAYSHAW, S. N., corrosion of salt-bath containers, 159*P*.
BREDENBECK, R., cast iron dies, 143*A*.
BREGMAN, A., cadmium plating, 114*A*.
BREWER, R. E. :
coking properties of coal, 175*A*.
plastic properties of coal, 133*A*, 176*A*.
BRICK, R. M., solubility of nitrogen in iron-chromium and iron-vanadium alloys, 124*A*.
BRIDDON, W., elected Member, 7*P*.
BRINSON, S. W., solidification of steel castings, 10*A*.
BRISBOIS, C. C., grating of castings, 97*A*.
BROCKAMP, B., Salzgitter iron ore deposits, 1*A*.
BROOKE, W. H., reheating furnaces of Broken Hill Proprietory Co., Ltd., 142*A*.
BROUGH, E., elected Member, 7*P*.
BROWN, W. R., blast-furnace practice, 33*P*.
BROWNE, V., Pluramelt process, 22*A*.
BRUCKNER, W. H., hardenability of carburising steel, 14*A*.
BRUK, A. S., effect of coke quality on blast-furnace operation, 134*A*.
BUCHANAN, W. Y., gases in cast iron, 96*A*.
BUCKWALTER, T. V. :
fatigue strength of axles, 156*A*.
photoelasticity, 117*A*.
BUNKER, H. J., microbiological anaërobic corrosion, 127*A*.
BURGESS, C. O., effect of chromium on oxidation of cast iron, 73*A*.
BURNLEY, H., elected Member, 7*P*.
BURNS, J. L., time-quenching of steel, 220*A*.
BURSUK, A. YA., determination of phosphorus, 235*A*.
BURWELL, J. T., crystal orientation in silicon iron, 72*A*.
BUTLER, E. H., jun., galvanic and thermomagnetic effects in iron and nickel, 118*A*.

CADRÉ, coal washing, 5*A*.
CALLINAN, E. E., heating of steel, 141*A*.
CAMERON, P., elected Member, 7*P*.
CAMPBELL, C. S., elected Associate, 9*P*.
CAMPBELL, T. C. :
steelmaking practice of Copperweld Steel Co., 138*A*.
welded tubes, 13*A*.
CANNARELLA, J. T. H., flocculation of washing water, 5*A*.
CARLSON, F. M., galvanising kettle, 22*A*.
CARLSSON, C. G., desulphurisation of iron, 94*A*.
CARMODY, W. H., by-product recovery, 177*A*.
CARPENTER, SIR H. C. H., obituary notice, 291*P*.
CARTWRIGHT, A. E., gating of castings, 97*A*.
CARUTHERS, W. H., blast-furnace slag, 178*A*.
CHADEYRON, A., effect of potassium chloride vapour on refractories, 87*A*.
CHADWICK, R. :
moulding sands, 97*A*.
scaling of salt-bath containers, 158*P*.
CHALLIS, G. H., pickling of steel, 113*A*.
CHALMERS, B. :
thickness measurement of tin coatings, 116*A*.
variations in thickness of tin coatings, 115*A*.
CHAMBERLAIN, E. A. C. :
Paper : "Corrosion of Steels by Molten Nitrates." *See* LLOYD, P.
CHAMBERS, H. B., tool steels, 157*A*.
CHARLESWORTH, P., elected Associate, 9*P*.
CHAVY, R., nickel-molybdenum cast iron, 30*A*.
CHAYKOVSKIY, M. D., microstructure of cast iron, 71*A*.
CHEKMAREV, A., energy consumption in rolling, 58*A*.
CHEMERIS, A. A., desulphurisation of coke, 91*A*.
CHESTERS, J. H. :
refractories for open-hearth furnaces, 3*A*.
refractories for steelworks, 43*A*.
CHIPMAN, J. :
iron oxide content of metal in open-hearth process, 182*A*.
slag-metal relationships in basic open-hearth process, 53*A*.
CLARK, H. T., determination of carbon in steel, 167*A*.
CLARKE, L., hydrogenation of coal, 6*A*, 92*A*, 93*A*.

CLAUSSEN, G. E.:
crystal growth, 71*A*.
cutting of metals, 18*A*, 109*A*.
defects in welds, 152*A*.
deformation of metals, 124*A*.
heating and cooling of iron, 152*A*.
temperature distribution in welds, 221*A*.
CLAYTON, D., seizure of lubricated balls, 157*A*.
CLEMENTS, F., blast-furnace practice, 31*P*.
CLEVELAND, C., heat-treatment plant of Norfolk and Western Railway, 60*A*.
CLEWS, F. H., effect of potassium chloride vapour on refractories, 87*A*.
CLINGAN, I. C., polishing of metals, 112*A*.
COATES, R. F., moulding of castings for hydraulic press, 98*A*.
COCKIN, E., elected Member, 7*P*.
CODDINGTON, P. L., stainless steel pressure vessels, 216*A*.
COGHILL, W. H., differential grinding of iron ore, 203*A*.
COLAM, L. D., lubricants, 13*A*.
COLDWELL, T. C., elected Member, 7*P*.
COLE, T. H., elected Member, 7*P*.
COLLIER, A. J., coal in Montana, 1*A*.
CONE, E. F., steel foundry industry in America, 48*A*.
CONLEY, J. E., bentonite, 173*A*.
CONWAY, C. G., elected Member, 7*P*.
COOPER, C., sulphur removal from benzole wash oils, 6*A*.
COOPER, W., elected Member, 7*P*.
CORIOLIS, E. G. DE, annealing, 59*A*.
CORNELIUS, H., hardness-testing machines, 27*A*.
CORSON, M. G., strength of steel and cast iron, 162*A*.
COTEL, E., Hungarian iron industry, 7*A*.
COTTON, A. F., fatigue of steel, 65*A*.
COUDERT, iron industry in Nevers district, 47*A*.
COWAN, R. J., heat treatment of malleable cast iron, 16*A*, 220*A*.
CRAFTS, W.:
inclusions in steel castings, 99*A*.
notched-bar impact tests at low temperatures, 67*A*.
CRAIG, J.:
remarks on Yaneske's paper, 79*P*.
speech at Luncheon, 3*P*.
CRAIG, O., pulverised coal firing, 132*A*.
CRAWFORD, J. T., coal washing, 89*A*.
CREEVY, J. A.:
solubility of nitrogen in iron-chromium and iron-vanadium alloys, 124*A*.
elected Associate, 9*P*.
CROMBIE, J. N., annealing of sheets, 15*A*.
CROMPTON, COL. R. E. B., obituary notice, 295*P*.
CROSBY, V. A., cast iron for brake drums, 194*A*.
CROSSLEY, A., elected Member, 7*P*.
CUMMINS, A. C., tolerances for rolled steel, 145*A*.

DAEVES, K., early iron from Cologne Cathedral, 39*A*.
DAHL, A. I., thermocouples, 147*A*.
DAMASCHKE, K., commencement of corrosion of iron, 35*A*.
DARKEN, L. S., equilibria in liquid iron with carbon and silicon, 52*A*.
DART, J. R., elected Member, 7*P*.
DAVIES, D. J., elected Associate, 9*P*.
DAVIS, C. W., bentonite, 173*A*.
DAVIS, J. D.:
coking properties of coal, 175*A*.
oxidation of coal, 92*A*.
plastic properties of coal, 133*A*, 176*A*.
DAVYDOV, A. L.:
determination of silica in slags, 168*A*.
determination of silicon, 75*A*.
DAWES, S., elected Member, 7*P*.
DAWSON, E. S., early stone blast-furnaces, 135*A*.
DAWSON, H. T., elected Member, 7*P*.
DAY, A. O., flame-hardening of cast iron, 59*A*.
DAYSON, J. C., elected Member, 7*P*.
DEAN, N., elected Member, 7*P*.
DELANO, P. H., differential grinding of iron ore, 203*A*.
DESCH, C. H.:
free-energy concept applied to alloys, 120*P*.
metals as engineering materials, 119*A*.
DESCROIX, L., German iron industry, 95*A*.
DE VANEY, F. D., concentration of manganiferous iron ore, 203*A*.
DEWEY, E. K., jun., metal spraying, 190*A*.
DIETRICH, O., Maybach strain-line process, 155*A*.

DOAN, G. E., radiography, 71*A*.
DOBROKHOTOV, N., surface quality of open-hearth ingots, 52*A*.
DOLAN, T. J.:
effect of coatings on corrosion-fatigue of steel, 164*A*.
lead-bearing steel, 19*A*.
DOLPHIN, J. R. V., pulverised fuel, 89*A*.
DONALDSON, J. W.:
fatigue and impact strengths of cast iron, 193*A*.
high-duty and alloy cast iron, 227*A*.
properties of cast iron, 162*A*.
thermal conductivity of iron and steel, 225*A*.
DOREY, S. F.:
welding of pressure vessels, 221*A*.
welding as a substitute for casting, 18*A*.
DÖRRENBERG, O., coreless induction furnaces, 139*A*.
DOST, F. J., cast iron for machine tools, 96*A*.
DOUGHERTY, E. W., atomic hydrogen, 185*A*.
DOVEL, J. P., blast-furnace hearth and bosh areas, 46*A*.
DOVGALEVSKIY, YA., stepped quenching of high-speed steel, 60*A*.
DOW, G. L., furnace doors, 181*A*.
DOWNIE, C. C., electrolytic tinplating of strip, 22*A*.
DOWSON, E. W., test-pieces for steel castings, 120*A*.
DUDLEY, W., welding of rail ends, 62*A*.
DUMA, J. A., solidification of steel castings, 10*A*.
DUNHAM, H., elected Member, 7*P*.
DUNNACHIE, W. J., by-product recovery from blast-furnace gas, 92*A*.
DYKSTRA, K. G., external corrosion of tin containers, 232*A*.

EAGAN, T. E., distortion in heat-treatment of Meehanite, 184*A*.
EBERT, F., X-ray examination of steel, 32*A*.
ECKBERG, A. R., welding of galvanised sheets, 108*A*.
EDGERTON, C. T., stresses in helical springs, 155*A*.
EDMONDSON, H. L., elected Member, 7*P*.
EDWARDS, C., silica bricks, 205*A*.
EDWARDS, C. A., D. L. PHILLIPS and H. N. JONES:
Paper: "The Influence of some Special Elements upon the Strain-Ageing and Yield-Point Characteristics of Low-Carbon Steels," 199*P*. *Discussion*, 223*P*. *Correspondence*, 228*P*. *Authors' Reply*, 232*P*.
EDWARDS, E. G., determination of iron, 166*A*.
EGAN, J. J.:
inclusions in steel castings, 99*A*.
notched-bar impact tests at low temperatures, 67*A*.
EILENDER, W., caustic embrittlement of boiler plate, 37*A*.
EISNER, A., hydrogenation of coal, 6*A*, 92*A*, 93*A*.
ELAM, CONSTANCE, non-uniform yielding in tensile tests, 25*A*.
ELDER, J. L., oxidation of coal, 92*A*.
ELDRED, M. G., centrifugal casting of brake drums, 10*A*.
EL'GOT, S. A., determination of grain size in steel, 197*A*.
ELLERICH, E., concentration of spathic ore, 2*A*.
ELLIOTT, A., elected Member, 7*P*.
ELWELL, J., elected Member, 7*P*.
EMBLETON, G. A., elected Member, 7*P*.
EMERY, E. T. G., insulating materials, 44*A*.
ENGEL, J. H., steel-faced cast iron dies, 56*A*.
EREMICHEV, V. V., determination of phosphorus in vanadium steel, 167*A*.
ESS, T. J.:
plant of American Rolling Mill Co., 11*A*.
plant of Andrews Steel Co., 11*A*.
strip mills of Republic Steel Corporation, 102*A*.
ESSER, H., proof stress, 26*A*.
EVANS, N. L., de-enamelling of sheets, 24*A*.
EVANS, T. E., smelting chrome ore in electric furnace, 211*A*.
EVENBAKH, R. I., molybdenum-vanadium steel, 120*A*.
EVEREST, A. B., alloy cast iron for steelworks plant, 30*A*.

FAHLENBRACH, H.:
elastic moduli of alloy steel, 25*A*.
magnetic materials for relay cores, 29*A*.

FAINT, H. W., polishing of steel, 188*A*.
FAIR, J., elected Member, 7*P*.
FAIRFIELD, H. H., centrifugal casting of brake drums, 10*A*.
FALLON, W. T., elected Member, 7*P*.
FANNING, R., measurement of impact strains by extensometer, 65*A*.
FARRANT, J. C., preparation of minerals, 2*A*.
FAUST, C. L., polishing of metals, 112*A*.
FAWKES, A. L., elected Member, 7*P*.
FEIN, M. L., hydrogenation of coal, 92*A*, 93*A*.
FENTON, R. M., atomic hydrogen, 185*A*.
FETTERS, K. L.:
iron oxide content of slag and metal in open-hearth process, 182*A*.
slag-metal relationships in basic open-hearth process, 53*A*.
FEYGIN, J. I., anti-friction cast iron, 194*A*.
FIELD, A. L., polishing of metals, 112*A*.
FIELDNER, A. C.:
coal research, 175*A*.
coking properties of coal, 175*A*.
FINNISTON, H. M., combustibility of coke, 90*A*.
FISCHER, W., effect of cooling rate on chromium steel, 34*A*.
FISHER, A.:
controlled atmospheres for heat treatment, 15*A*, 106*A*.
spectroscopic analysis of steel, 167*A*.
FISHER, C. H., hydrogenation of coal, 6*A*, 92*A*, 93*A*, 134*A*.
FITZPATRICK, R. N., elected Associate, 9*P*.
FLEMING, A. P. M., electricity in metallurgical processes, 5*A*.
FLEMING, J. L., elected Member, 7*P*.
FLOOD, R. F.:
flame gouging, 221*A*.
flame machining, 152*A*.
FOLEY, F. B., properties of metals at low temperatures, 68*A*.
FORGENG, W. D., inclusions in steel castings, 99*A*.
FOXWELL, G. E., reconstruction of coking plant, 5*A*.
FRANCIS, J. L., production of pressure-resistant castings, 98*A*.
FRANKLIN, R. J., welding of cast iron, 185*A*.
FRANKS, R., effect of low-temperature heat treatment on elastic properties of stainless steel, 195*A*.
FRASER, N. C., fatigue of steel, 65*A*.
FRASER, N. G., elected Member, 7*P*.
FRÉCHETTE, V. D., recrystallisation of magnesia, 43*A*.
FRIEND, J. N., corrosion of ferrous metals, 126*A*.
FRISCHMAN, T. A., carburisation, 14*A*.
FROST, S., elected Member, 7*P*.

GALIBOURG, J., hot torsion tests, 26*A*.
GANAHL, C. DE., stainless steel for aircraft, 221*A*.
GARCIA, V. I., impact tests, 117*A*.
GARTSIDE, F., elected Member, 7*P*.
GEILER, H. F., mineral resources of Finland, 173*A*.
GELLER, W.:
electrodeposition of iron from silicate melts, 53*A*.
iron-cobalt-antimony system, 34*A*.
GENDER, R. A., galvanising of sheets, 115*A*.
GENSAMER, M., static crack strength of metals, 222*A*.
GERBER, J. S.:
Perrin process, 77*P*.
remarks on Walton's paper, 31*P*.
GERSZONOWICZ, S., impact tests, 117*A*.
GIFFEN, E., elected Member, 7*P*.
GILES, G. W.:
Paper: "Non-Metallic Inclusions in Steel." *See* HATFIELD, W. H.
GILLOT, J. P., obituary notice, 297*P*.
GJERS, J., obituary notice, 297*P*.
GOETZEL, C. G., fatigue of porous metals, 156*A*.
GOLD, J. H., elected Member, 7*P*.
GOLDSBROUGH, W., elected Member, 7*P*.
GOLIKOV, I., annealing of tool steel, 15*A*.
GONSER, B. W., tinplate for canning industry, 22*A*.
GOODGER, A. H., design of pressure plant, 63*A*.
GORBUNOV, A., stepped quenching of high-speed steel, 60*A*.
GORDON, R., elected Member, 7*P*.
GORELIK, A., "defectoscope," 123*A*.
GOSS, N. P., lattice distortion in deformed Alpha iron, 192*A*.
GOTOH, Y., magnetic roasting of iron ore, 85*A*.

GOULD, L. J., welded blast-furnace stack, 135*A*.
GRAF, S. E., bend-fatigue testing machine, 66*A*.
GRAHAM, H. W., work-brittleness test, 65*A*.
GRANBERRY, H., grain size of weld deposits, 18*A*.
GRAY, A. G., determination of tungsten, 75*A*.
GRAY, T. H., hardness conversion tables, 156*A*.
GREEN, A. T., effect of potassium chloride vapour on refractories, 87*A*.
GREENFIELD, S., elected Associate, 9*P*.
GREENIDGE, C. T., corrosion of copper steel, 38*A*.
GREGG, J. L., spectrographic analysis, 77*A*.
GREGORY, E., case-hardening, 184*A*.
GRENINGER, A. B., decomposition of austenite, 198*A*.
GREY-DAVIES, T.:
defects in ingots, 139*A*.
effect of elements in steel, 120*A*.
open-hearth process, 100*A*.
GRIEVE, J., maganous-oxide/titanium-dioxide and manganous-oxide/ferrous-oxide/titanium-dioxide systems, 72*A*.
GRIFFITH, H. M., open-hearth practice, 51*A*.
GRIGOR'EV, F., "crusts" in ingots, 54*A*.
GROSS, F., open-hearth plant of Australian Iron and Steel, Ltd., 100*A*.
GROSSMANN, M. A., quenching charts, 61*A*.
GRYAZNOV, N. S., properties of coke, 134*A*.
GUILD, J., optical smoothness meter, 188*A*.
GUILLET, L.:
hot torsion tests, 26*A*.
lead-bearing steel, 12*A*.
GUPTA, S. D., rolling mills of Tata Iron and Steel Co., 102*A*.
GUTMAN, S. H., determination of phosphorus in vanadium steel, 167*A*.

HABART, H.:
impact tests at low temperatures, 68*A*.
steels for oil-heater tubes, 70*A*.
HADDEN, R. M., elected Member, 7*P*.
HADFIELD, SIR R., obituary notice, 285*P*.
HAIGH, B. W., coal carbonisation, 90*A*.
HAIM, G., coating thickness of welding electrodes, 107*A*.
HALL, H. G., malleable cast iron, 9*A*.
HALL, P. R., silicon recovery in welding of cast iron, 107*A*.
HALL, R. D., coal-cleaning plant of Anthracite Coal Co., 89*A*.
HALL, R. E., failure of boiler tubes, 164*A*.
HALLEY, J. W.:
lead-bearing steel, 110*A*.
precipitation hardening of copper steel, 193*A*.
HAMILTON, W. G., flame hardening, 104*A*.
HANLEY, H. R., galvanising, 115*A*.
HARBORD, V., Perrin process, 83*P*.
HARDY, H. K., elected Associate, 9*P*.
HARRIS, B. M., elected Member, 7*P*.
HARRISON, J. M., elected Member, 7*P*.
HARTLAND, F. E., elected Member, 7*P*.
HARTMAN, W. G., heating of galvanising kettle, 114*A*.
HATFIELD, W. H.:
Perrin process, 78*P*.
speech at Luncheon, 4*P*.
structure of cementite, 104*P*.
HATFIELD, W. H., and G. W. GILES:
Paper: "Non-Metallic Inclusions in Steel. Quantitative Evaluation. — Part I," 237*P*.
Appendix, History of the Attempt to Count and Evaluate Inclusions, 251*P*. *Discussion*, 257*P*. *Correspondence*, 266*P*. *Authors' Reply*, 275*P*.
HAUFFE, K., liquidus curves of intermetallic compounds, 125*A*.
HAVEN, W. A., blast-furnace practice, 45*A*.
HAWTIN, A. S., cast iron for enamelling, 9*A*.
HAY, R., slag systems, 211*A*.
HAYWOOD, F. W.:
carburisation of steel, 104*A*.
hardening furnaces, 150*A*.
HEALEY, M. V., stress relief of castings, 59*A*.
HEFFLEY, J., flame scarfing of billets, 188*A*.
HELLER, L., magnetising-roasting of spathic ore, 2*A*.
HEMPEL, M., fatigue cracks in steel, 224*A*.

HENDERSON, D. M., jun., shearing of steel, 218*A*.
HENDRICKS, T. A., coal in Oklahoma, 1*A*.
HENKE, G., manganese loss in open-hearth process, 12*A*, 183*A*, 214*A*.
HENRY, O. H.:
crystal growth, 71*A*.
defects in welds, 152*A*.
deformation of metals, 124*A*.
heating and cooling of iron, 152*A*.
temperature distribution in welds, 221*A*.
HERGE, W. J., impact tests at low temperatures, 68*A*.
HERMANN, C. C.:
cleaning of metals, 20*A*.
forging of hammers and axes, 143*A*.
HERTY, C. H., jun.:
production of steel to physical requirements, 138*A*.
slag control in open-hearth furnace, 139*A*.
HESS, L. J., pipe mill of Bethlehem Steel Co., 146*A*.
HESS, W. F, spot welding of steel, 62*A*.
HEUER, R. P., refractories for basic open-hearth furnaces, 131*A*.
HEWITT, L. D., elected Member, 7*P*.
HEYN, H. M., burners for heat-treatment furnaces, 106*A*.
HIBERT, C. L., spot welding, 17*A*.
HIBI, T.:
change in damping coefficient due to magnetisation, 29*A*.
torsional modulus of ferromagnetic substances, 29*A*.
HIDNERT, P., thermal expansion of chromium-vanadium steel, 30*A*.
HIRD, J., moulding of castings for electric motors, 98*A*.
HIRST, A. A., coal cleaning, 175*A*.
HIRST, L. L., hydrogenation of coal, 134*A*.
HITE, E. E., refractories for soaking pits, 44*A*.
HOCK, A. G., remarks on Yaneske's paper, 77*P*.
HODGE, W. W., disposal of waste pickling liquor, 113*A*.
HOFFMAN, C. F., manufacture of low-silicon pig iron, 178*A*.
HOLGATE, J. E., blast-furnace practice in South Africa, 28*P*, 32*P*.
HOLGATE, T. E., obituary notice, 297*P*.
HOLLEY, E. G., static and fatigue torsion strength of steel, 223*A*.
HOLLIS, H. H., welding practice in coking plants, 18*A*.
HOLM, T., mechanical stokers for reheating furnaces, 55*A*.
HOLMES, C. R.:
coking properties of coal, 175*A*.
plastic properties of coal, 133*A*, 176*A*.
HOLT, M. L., determination of tungsten, 75*A*.
HOLWAY, W. G., elected Associate, 9*P*.
HOPKINS, B. E., elected Associate, 9*P*.
HOPKINS, J., welded tubes, 13*A*.
HORGER, O. J.:
fatigue strength of axles, 156*A*.
photoelasticity, 117*A*.
HOWELL, D., elected Member, 7*P*.
HRUSKA, J. H., fatigue tests of welded joints, 108*A*.
HUDSON, J. C.:
corrosion of iron ore wagons, 196*P*.
corrosion tests, 179*P*.
scaling of steel, 157*P*.
HUGILL, W., mullite, 88*A*.
HULL, J., elected Associate, 9*P*.
HUNTER, G. A., elected Member, 7*P*.
HURST, J. E.:
graphite absorption in heat treatment of cast iron, 16*A*.
nitriding, 149*A*.
HURST, T. L., action of alkalies on refractories, 206*A*.
HUTCHISON, G. J. B., elected Member, 7*P*.
HUTTON, W. G., elected Member, 7*P*.

IMAIZUMI, K., basic process in Japan, 100*A*.
IMHOFF, W. G.:
durability of zinc coatings, 115*A*.
fluxes in galvanising, 190*A*.
tinning of mik cans, 23*A*.
tinning practice, 115*A*.
IRISH, P. R., spectrographic analysis, 77*A*.
IRVINE, J., elected Member, 7*P*.
ISAROV, G. M., properties of coke at high temperatures, 92*A*.
ISENBURGER, H. R., X-ray examination of steel, 32*A*.
ISHII, R.:
determination of nitrogen, 77*A*.
determination of silicon, 75*A*.
IVANOV, O. S., high-speed steel, 121*A*.
IVANOV, P., refining of steel, 51*A*.

JACK, A. C., elected Member, 8*P*.
JACKSON, H. H., nitriding of steel, 104*A*.
JANSSON, S., titanium in blast-furnace hearths, 208*A*.
JARVIS, F. W., elected Associate, 9*P*.
JARVIS, S. E., elected Member, 8*P*.
JAY, A. H.:
atomic structural changes of steel during deformation, 229*P*.
remarks on Lipson and Petch's paper, 104*P*.
use of free-energy principle in construction of equilibrium diagrams, 121*P*.
elected Member, 8*P*.
JEFFRIES, W. J., corrosion of materials, 126*A*.
JENKINSON, E. A.:
Paper: "The Iron-Plating of Specimens for Microscopical Examination," 89*P*. *Correspondence*, 93*P*.
load maintenance in creep tests, 159*A*.
JENKS, G. F., failure of gun barrel, 155*A*.
JENNINGS, L. D., resistance welding, 62*A*.
JETER, E. C., cast steel parts for Ford tractors, 136*A*.
JOHNSON, A. E., creep under combined tension and torsion, 226*A*.
JOHNSON, D. R., metal spraying, 190*A*.
JOHNSON, H. W.:
blast-furnace of Inland Steel Co., 46*A*, 94*A*.
quality of iron for open-hearth practice, 178*A*.
JOHNSON, J. S., elected Associate, 9*P*.
JÖLLENBECK, E., normalising and annealing of welded joints, 60*A*.
JONES, H. N.:
Paper: "The Influence of some Special Elements upon the Strain-Ageing and Yield Point Characteristics of Low-Carbon Steels." *See* EDWARDS, C. A.
JONES, L., elected Member, 8*P*.
JONES, L. J., coal in New South Wales, 1*A*.
JONES, SIR W. BENTON, Bt., elected Member, 8*P*.
JOSEPH, T. L., blast-furnace practice, 45*A*.
JOYNES, C., foundry industry in Great Britain, 48*A*.
KAIN, C. H., test-pieces for steel castings, 120*A*.
KAMENSKIY, V., rimming steel, 52*A*.
KANTER, J. J., valve castings, 136*A*.
KASPER, C., electrodeposition, 21*A*, 114*A*.
KATÔ, H., separation of metals by hydrogen sulphide, 77*A*.
KAWASAKI, M., effect of low-temperature annealing on cold-drawn chromium-vanadium steel wire, 195*A*.
KAYSER, J. F., permanent magnets, 224*A*.
KAYSTRO, N., blast-furnace practice, 47*A*.
KAZANTSEV, I., heat supply to open-hearth furnaces, 50*A*.
KEEN, W., elected Member, 8*P*.
KELLY, H. E., by-product recovery, 177*A*.
KELLY, J. D., plant of American Rolling Mill Co., 11*A*.
KEMPF, H., determination of nitrogen, 77*A*.
KENT, C. R., constitution of West Australian coal, 132*A*.
KENWORTHY, L., corrosion of heating systems, 38*A*.
KENYON, A. F., power requirements for strip mills, 102*A*.
KENYON, J. N., tensile-fatigue testing machine for wire, 156*A*.
KERNAHAN, W. C., plant of Copperweld Steel Co., 213*A*.
KERR, J., elected Member, 8*P*.
KHIMUSHIN, F., stainless steel wire, 57*A*.
KIDANI, Y., fatigue testing machine, 156*A*.
KIEFER, G. C., cleaning of stainless steel, 20*A*.
KIELMAN, J. C., elected Member, 8*P*.
KIESSLER, H., embrittlement of heat-resistant steel, 226*A*.
KIKUCHI, R., cutting efficiency of high-speed steel, 186*A*.
KIMURA, R., elastic moduli of ferromagnetic materials, 158*A*.
KING, J., moulding of castings for hydraulic press, 98*A*.
KINLEY, A. H., electric driving of rolling mills, 218*A*.
KLEIN, H., smelting of zinc-bearing materials in blast-furnace, 7*A*.
KLOPSTOCK, H., welding of cast iron, 151*A*.
KNECHTEL, M. M., coal in Montana, 1*A*.

KNICKERBOCKER, R. G., smelting chrome ore in electric furnace, 211*A*.
KNOX, J. D., plant of Copperweld Steel Co., 138*A*.
KNUDSEN, H. A., corrosion and tuberculation, 200*A*.
KOCHUGOVA, E. I., determination of silica in slags, 168*A*.
KONTOROVICH, L., iron-nickel-aluminium alloys, 66*A*.
KOPYTOV, V., action of sulphur on steel, 142*A*.
KÖRBER, F., reduction equilibria of oxides, 94*A*.
KORI, T., pitting of metals, 28*A*.
KOROLENKO, N. G., bearing metal from iron powder, 179*A*.
KOROTIN, I. M., magnetic tests of steel wire, 194*A*.
KORPIUN, J., corrosion of zinc coatings, 39*A*.
KÖSTER, W.:
iron-cobalt-beryllium system, 34*A*.
iron-cobalt-tantalum system, 34*A*.
KOVALENKO, I., determination of gases in steel, 76*A*.
KRAUSE, D. E., phosphorus steel for enamelling, 23*A*.
KREMER, G., magnetic roasting of brown iron ore, 85*A*.
KRISHNAN, M. S., mineral wool, 47*A*.
KRISHNASWAMI, K. R., estimation of iron and vanadium, 166*A*.
KROON, R. P., fatigue testing machines for turbine blades, 193*A*.
KUBYSHKINA, T. D., magnetic tests of piston rings, 118*A*.
KUKSINSKAYA, V. E., microstructure of cast iron, 71*A*.
KUNITSYN, N., scarfing of billets, 112*A*.
KUNKLER, L. E., aluminising process, 114*A*.
KURODA, M., abrasion of metals, 28*A*.

LANDGRAF, G. F., corrosion-resistant steel, 73*A*.
LANDON, R. D., tensile tests of malleable cast iron, 153*A*.
LANGE, S. G. P. DE., welding of sheets, 108*A*.
LARKE, W. M., elected Member, 8*P*.
LASSNER, H. F., flame cutting of clad steel, 221*A*.
LATHE, F. E., refractories in Canada, 43*A*.
LEBEDEV, P. S., determination of gases in steel, 76*A*.
LEDER, P. L. J., elected Associate, 9*P*.
LEE, O. R. J., notched-bar impact test, 117*A*.
LEFFINGWELL, G., glycerine in metal processing, 21*A*.
LEGRAYE, M., iron ore in Sweden, 84*A*.
LEITER, R. W. E., yield point of steel, 154*A*.
LENTZ, G. W., chipping of billets, 20*A*.
LEPAGE, L. J. C., Belgian wire industry, 216*A*.
LEPP, H.:
Reply to Correspondence on Paper: "The Oxygen/Hydrogen/Molten-Iron System," 281*P*.
LESSELLS, J. M., tension tests, 64*A*.
LESSER, M. A., glycerine in metal processing, 21*A*.
LE THOMAS, A., heat treatment of castings, 16*A*.
LEVE, N., inclusions in copper steel and chromium-copper steel, 72*A*.
LEVSHUK, I. YA., magnetic tests of steel wire, 194*A*.
LEWIS, A. C., obituary notice, 297*P*.
LEWIS, B., elected Member, 8*P*.
LEWIS, K. B., wire drawing, 144*A*.
LEWIS, T. A., waste-heat boilers, 4*A*.
LINCOLN, R. F., core blowing, 9*A*.
LIPPERT, T. W.:
continuous casting, 49*A*.
Pacific Coast steel industry, 8*A*.
LIPSON, H., and N. J. PETCH:
Paper: "The Crystal Structure of Cementite, Fe_3C," 95*P*. *Correspondence*, 104*P*. *Authors' Reply*, 105*P*.
LIPSON, H., and A. J. C. WILSON:
Paper: "Some Properties of Alloy Equilibrium Diagrams Derived from the Principle of Lowest Free Energy," 107*P*. *Correspondence*, 119*P*. *Authors' Reply*, 122*P*.
LISTER, W., elected Member, 8*P*.
LIVSHITS, B., iron-nickel-aluminium alloys, 66*A*.
LIVSHITS, M. I., desulphurisation of coke, 91*A*.
LJUNGGREN, BO O. W. L.:
Reply to Discussion on Paper: "Method of Sclero-Grating Employed for the Study of Grain Boundaries and of Nitrided Cases," 277*P*.
LLOYD, A. H., cutting fluids, 111*A*.

LLOYD, E. H., elected Associate, 9*P*.
LLOYD, P., and E. A. C. CHAMBERLAIN :
Paper : "Corrosion of Steels by Molten Nitrates," 141*P*. *Correspondence*, 156*P*. *Authors' Reply*, 163*P*.
LONGDEN, E., contraction in cast iron, 98*A*.
LONGDEN, G., denseners for castings, 49*A*.
LONGDEN, ALDERMAN J. A., speech at Luncheon, 1*P*.
LONGENECKER, C., plant of Vanadium Alloys Steel Co., 213*A*.
LORIG, C. H. :
corrosion of copper steel, 38*A*.
foundry practice, 96*A*.
pearlitic malleable cast iron, 162*A*.
phosphorus steel for enamelling, 23*A*.
LORIMER, H., elected Member, 8*P*.
LOUX, J. H., tube heating furnace, 220*A*.
LOW, A. S., welding, 108*A*.
LUCE, G., elected Associate, 9*P*.
LUCKS, C. F., pyrometers, 147*A*.
LUKINA, Z. E., determination of iron, 234*A*.
LUNN, R. G., elected Associate, 9*P*.
LUYKEN, W. :
concentration of spathic ore, 2*A*.
magnetic roasting of brown iron ore, 85*A*.
magnetic roasting of spathic ore, 2*A*.
LUXFORD, C. A., stress measurement by magnetostriction, 26*A*.
LYSAGHT, D. C., obituary notice, 298*P*.

MABB, P., deep-drawing of steel, 143*A*.
MABEE, W. C., cathodic protection of water tanks, 231*A*.
MCADAM, D. J., jun., static crack strength of metals, 223*A*.
MCARTHUR, D. A., galvanising of sheets, 115*A*.
MACARTNEY, W. C., obituary notice, 298*P*.
MCCABE, L. C., coal preparation, 132*A*.
MCCARROLL, R. H., cast steel part for Ford tractors, 136*A*.
MCCRACKEN, J., elected Member, 8*P*.
MCCURDY, F. T., nickel-molybdenum-iron alloys, 73*A*.
MCCUTCHAN, A., turbine materials, 161*A*.
MCDOWELL, J. S., sprung-arch roofs for furnaces, 44*A*.
MACGREGOR, C. W., tensile tests, 153*A*.
MCKIMM, P. J. :
heating of steel, 141*A*.
residual tin in steel, 56*A*.
slivers in cold-rolled strip, 58*A*, 145*A*.
MCKINNON, H. L., storage of foundry sand, 136*A*.
MCLEOD, A., de Lattre pickling process, 189*A*.
MCMINN, E., elected Member, 8*P*.
MCMULLAN, O. W., interpretation of test results, 25*A*.
MCNAIR, C., elected Member, 8*P*.
MCPHERSON, D., cyanide hardening, 219*A*.
MCSKIMMINGS, W., jun., elected Member, 8*P*.
MAGALIS, B. W., refractories for high-frequency furnaces, 174*A*.
MAGRATH, J. G. :
descaling of billets, 20*A*.
descaling of steel, 188*A*.
MAHIN, E. G., carburisation of steel, 148*A*.
MAIN, S. A. :
evaluation of inclusions, 270*P*.
strain-ageing of steel, 225*P*.
structure of cementite, 104*P*.
MANDEL, L., transfer cars for ingots, 101*A*.
MANJOINE, M., tensile tests at high temperatures, 160*A*.
MANTELL, C. L., lead as lubricant in wire drawing, 217*A*.
MANTERFIELD, D., Perrin process, 79*P*.
MARKOVETO, M. P., ductility of metals in bending, 64*A*.
MARLL, J. G., hot tinning, 190*A*.
MARSH, D. W., elected Member, 8*P*.
MARSHALL, A., moulding of engineering castings, 48*A*.
MARSHALL, D. F., coke consumption in blast-furnaces, 30*P*.
MARSHALL, W. K. B., elected Associate, 9*P*.
MARTIN, E. D., lead-bearing steel, 110*A*.
MARTIN, G. T. O., enamelling of cast iron, 116*A*.
MARTIN, L. C., electron microscope, 32*A*.
MASIMA, M., abrasion of metals, 28*A*.
MASSON, C. G., elected Member, 8*P*.

MATHEWS, F. M., fatigue of steel, 65*A*.
MATHIEU, K., transformations in manganese steel, 124*A*.
MATTHEW, T. U., wear of metals, 27*A*.
MATTHEWS, F. J., gas producer practice, 6*A*.
MATVEEV, M. A., determination of inclusions in iron, 236*A*.
MAURER, E.:
corrosion of stainless steel, 164*A*.
inclusions in steel, 12*A*.
MAWHINNEY, M. H.:
billet and slab furnaces, 142*A*.
early stone blast-furnaces, 135*A*.
sheet and strip furnaces, 106*A*.
MAXWELL, H. L., stainless steel for chemical equipment, 69*A*.
MAYER, G., elected Associate, 9*P*.
MEHL, R. F., diffusion of carbon in austenite, 198*A*.
MELLOR, G. A., load maintenance in creep tests, 159*A*.
MELMOTH, F. A., electric furnaces for foundries, 9*A*.
MERZ, C. H., obituary notice, 299*P*.
MEYER, C. H., low-friction corrosion-resistant alloys, 35*A*.
MEYER, H. H.:
elastic moduli of alloy steel, 25*A*.
magnetic materials for relay cores, 29*A*.
MILES, R. E., elected Member, 8*P*.
MILFORT, N. V., desulphurisation of coke, 91*A*.
MILLER, F. H., stress relief of castings, 59*A*.
MILLER, R. F., creep of alloy steel, 159*A*.
MITCHELL, J.:
Perrin process, 76*P*.
remarks on Walton's paper, 31*P*.
MITCHELL, R. W., cleaning of metals, 20*A*.
MITCHELL, W. M., stainless steel, 69*A*.
MONYPENNY, J. H. G.:
brittle phase in chromium steel, 72*A*, 199*A*.
corrosion-resistant and heat-resistant steel, 31*A*.
work of Sorby, 197*A*.
MOONEY, F. F., welding of fractured pulleys and gears, 108*A*.
MOORE, B., fused magnesia, 3*A*.
MOORE, E. J., elected Associate, 9*P*.
MOORE, H. F., stress, strain and structural damage, 65*A*.
MOORE, S. O., elected Member, 8*P*.
MOORE, W. E., arc furnaces, 53*A*.
MOORWOOD, J. M., obituary notice, 300*P*.
MORGAN, A. F., clay gun, 178*A*.
MORGAN, R., X-ray study of inclusions in steel, 33*A*.
MORTON, A. M., expansion of refractories, 206*A*.
MÖRTSELL, S.:
ball wear in ball mills, 86*A*.
crushing of Swedish iron ore, 85*A*.
MOTOK, G. T., effect of gases and oxides on machinability, 110*A*.
MOTT, R. A., swelling of coal, 90*A*.
MOTTERSHAW, F. J., elected Member, 8*P*.
MOZHAROV, V., open-hearth practice, 51*A*.
MUIR, S., elected Associate, 9*P*.
MUKHERJEE, A. N., iron ore in Punjab, 84*A*.
MUKHERJI, M. M., Raniganj coalfield, 84*A*.
MUNYARD, M. H., elected Member, 8*P*.
MUTUZAKI, K., iron-aluminium-silicon diagram, 199*A*.
MUXLOW, H. L., elected Member, 8*P*.

NADAI, A., tensile tests at high temperatures, 160*A*.
NAKAHARA, M., plastic slip under tensile-torsional stresses, 155*A*.
NAUJOKS, W., forgings, 143*A*.
NEHL, F., alkali-resistance of metals, 36*A*.
NELSON, W., salt baths for hardening, 148*A*.
NEWELL, H. D., effect of phosphorus on chromium-molybdenum steel, 70*A*.
NICHOLLS, W., elected Member, 8*P*.
NIKLEWSKI, B., jun., enamels for cast iron, 116*A*.
NIKOLIN, V. I., magnetic tests of steel wire, 194*A*.
NIKONOV, I., melting of alloy steel, 214*A*.
NISHIHARA, T., pitting of cylinders, 28*A*.
NISHINA, T., magnetic viscosity of iron single crystals, 29*A*.
NOACK, K., burning out of valves in oxygen pressure regulators, 18*A*.
NORBURY, A. L., composition of intermetallic compounds, 120*P*.
NORCROSS, F. S., jun., manganese ore in Cuba, 84*A*.

NORLIN, E., protective value of coatings, 126*A*.
NORMAN, E. E., cathodic protection of water tanks, 231*A*.
NORTON, F. J., diffusion of hydrogen through steel, 68*A*.

O'BRIEN, detection of caustic embrittlement, 232*A*.
OELSEN, W., reduction equilibria of oxides, 94*A*.
OGINO, Y., galvanising of pipes, 115*A*.
OLIVER, D. A.:
carbide-forming elements in steel, 231*P*.
evaluation of inclusions, 272*P*.
OLSON, J. E., moulding of cylinder castings, 98*A*.
OLZAK, Z. E., effect of phosphorus on chromium-molybdenum steel, 70*A*.
ORLETS, P., high-speed steel, 19*A*.
ORLOV, N. I., drilling tests, 111*A*.
OSBORN, H. B., jun., surface hardening by induction heating, 14*A*.
ÔSHIBA, F.:
hardness changes during fatigue test, 29*A*.
recovery in fatigue strength by annealing, 224*A*.
OSTHOLD, P., England's war economy, 47*A*.
OSTROUKHOV, M., viscosity of blast-furnace slag, 179*A*.
OTLEY, R., elected Member, 8*P*.
OWEN, A. G. B., elected Member, 8*P*.
OWEN, L. G., elected Associate, 9*P*.

PAMELY, E. J., elected Member, 8*P*.
PARDOE, W. S., effect of temperature and pressure on venturi tubes, 161*A*.
PARKER, F. S., coal in Montana, 1*A*.
PARKER, R. T., elected Member, 8*P*.
PARKES, R. A., corrosion of salt-bath containers, 156*P*.
PARKINSON, W., elected Member, 8*P*.
PARTRIDGE, E. P., failure of boiler tubes, 164*A*.
PASHKEVICK, A. Z., heating of coke ovens, 90*A*.
PATERSON, J. H.:
corrosion of ships, 73*A*.
electrolytic corrosion of ship structures, 38*A*.
PAYSON, P., effect of elements on steel, 69*A*.
PEACH, W. I., obituary notice, 300*P*.
PEARCE, J. G., uses of cast iron, 119*A*.
PEARSON, F., elected Member, 8*P*.
PEIRCE, W. M., corrosion of galvanised tanks, 37*A*.
PERKIN, T. S., elected Member, 8*P*.
PERKINS, C. T., rust proofing of metals, 23*A*.
PERRY, H. W., stainless steel for aircraft, 216*A*.
PERRY, R. P., rolls for sheet mills, 13*A*.
PETCH, N. J.:
Paper: "The Crystal Structure of Cementite, Fe_3C." *See* LIPSON, H.
PETIX, J. M., baking ovens for wire, 144*A*.
PETRASCHECK, W. E., manganese in Bulgaria, 1*A*.
PEVZNER, L. E., classification of steel by thermo-electric method, 122*A*.
PFEIL, L. B., strain-ageing and yield point of steel, 227*P*.
PHAIR, W. A., moulding sand, 9*A*.
PHILBROOK, W. O., slag control in basic process, 11*A*, 182*A*.
PHILIPPI, H., composite tubes, 22*A*.
PHILLIPS, D. L.:
Paper: "The Influence of Some Special Elements upon the Strain-Ageing and Yield Point Characteristics of Low-Carbon Steels." *See* EDWARDS, C. A.
PHILLIPS, W. J., hot tears in steel castings, 180*A*.
PICKUP, F. C., elected Member, 8*P*.
PILLING, N. B., corrosion of copper steel and copper-nickel steel, 163*A*.
PINCOTT, P. D., soundness in castings, 97*A*.
PINDER, H. W.:
evaluation of inclusions, 271*P*.
heat treatment of high-speed steel, 105*A*.
tool steel, 12*A*, 213*A*.
PIWOWARSKY, E.:
effect of ladle additions on cast iron, 69*A*.
ladle additions to cast iron, 9*A*.
PLANT, W., elected Member, 8*P*.
POLLARD, R. E., surface treatment of steel prior to painting, 191*A*.
PORTER, W. C., surface treatment of steel prior to painting, 191*A*.
PORTEVIN, A., properties of steel, 69*A*.
PÖSCHL, T., tensile testing machine with microscope attachment, 153*A*.

POSPELOV, D., blast-furnace practice, 178*A*.
POWELL-REES, T., elected Member, 8*P*.
PRAY, H., polishing of metals, 112*A*.
PRESTON, G., oil-refining plant of Wheeling Steel Corporation, 133*A*.
PRICE, B. R., lead-bearing steel, 19*A*.
PRILL, P., passivating effect of activated carbon, 36*A*.
PROCTOR, C. P., coal washing, 89*A*.
PROSVIRIN, V. I.:
corrosion of heat-treatment pots, 200*A*.
effect of carburised layer on quenching of core, 184*A*.
PUDDEPHAT, S. M., elected Member, 8*P*.
PUGH, E. M., galvanic and thermo-magnetic effects in iron and nickel, 118*A*.

QUENNERSTEDT, T., Swedish iron ore, 203*A*.
QUEST, C. F., tensile strength of carbon steel, 153*A*.

RÄDEKER, W., clad metals, 21*A*.
RAGSDALE, E. J. W., stainless steel for aircraft, 70*A*.
RAINE, A. J., obituary notice, 300*P*.
RAMAN, S. V., elected Associate, 9*P*.
RAMSAY, D. D., elected Member, 8*P*.
RASSBACH, H. P., electric furnace alloy steel for forgings, 53*A*.
RATNER, S., stainless steel wire, 57*A*.
REES, O. W., coal preparation, 132*A*.
REESE, D. J., cupola practice, 48*A*.
REEVE, L.:
Paper: "The Corrosion of Mild and Copper-Bearing Steel Panels in Iron-Ore Wagons." 191*P*. *Correspondence*, 196*P*. *Author's Reply*, 197*P*.
welded specimens from Hasselt Bridge, 17*A*.
RENGER, M., nomogram for determining electrode quantities in welding, 17*A*.
REYBURN, A., alloy cast iron for railroad equipment, 30*A*.
REYNOLDS, D. A.:
carbonisation of coal, 6*A*.
coking properties of coal, 175*A*.
REZNIK, B. E., determination of silicon, 75*A*.
RICHARDSON, H. M., effect of potassium chloride vapour on refractories, 87*A*.
RICHTER, G., welding of plated sheets, 17*A*.
RIDDLE, L. E., Gayley's work on dry-air blast, 135*A*.
RIMARSKI, W., burning-out of valves in oxygen pressure regulators, 18*A*.
RINKER, E. C., cleaning of metals, 20*A*.
RIVA-BERNI, A. DE., German iron industry, 95*A*.
ROBERTSON, H. S., open-hearth furnace roofs, 181*A*.
ROBIETTE, A. G., salt baths for hardening, 148*A*.
ROBINSON, A., remarks on Yaneske's paper, 76*P*.
ROBINSON, E. L.:
creep tests, 160*A*.
relaxation tests at high temperatures, 161*A*.
ROBITSCHEK, J., chromite and chrome-magnesite bricks, 174*A*.
RODDEN, C. J., determination of arsenic, 75*A*.
ROESCH, K., chromium-steel castings, 69*A*.
ROLL, F.:
corrosion of refrigerator parts, 37*A*.
tensile strength of cast iron, 25*A*.
ROOY, G. DE., high-tensile steel, 31*A*.
ROSE, A., effect of cooling rate on chromium steel, 34*A*.
ROSE, R. S., toughness of steel, 64*A*.
ROSS, B. G., die-making practice, 216*A*.
ROUSSEAU, A. O., grinding of billets, 188*A*.
ROY, S. K., iron ore in Punjab, 84*A*.
ROYER, M. B., smelting chrome ore in electric furnace, 211*A*.
ROYSTON, R. W., elected Member, 8*P*.
RUDBAKH, Z., stainless steel wire, 57*A*.
RUDER, W. E., transformer steel, 158*A*.
RUDORFF, D. W.:
nitriding of steel, 149*A*.
turbo-blower, 47*A*.
RUSH, R. M., design of blast-furnace blowers, 208*A*.
RUSSELL, G. A. V., Perrin process, 82*P*.
RUSSELL, H. W., pyrometers, 147*A*.
RUSSELL, P. A., cast iron for machine tools, 19*A*, 119*A*.

RUSSELL, R., jun., refractory bricks, 174*A*.
RUTBERG, K., iron ore production in Sweden, 85*A*.
RYAN, B., elected Member, 8*P*.

SACHS, G.:
rolling of sheet and strip, 58*A*.
stress raisers, 223*A*.
SAITO, S., wear of metals, 28*A*.
SALMON, W. H., elected Member, 8*P*.
SAMANS, C. H., creep of stainless steel, 159*A*.
SAMARIN, A., determination of gases in steel, 76*A*.
SAMARIN, S., "defectoscope," 123*A*.
SANDBERG, O. F. A., obituary notice, 301*A*.
SANDERSON, L., alloys for aircraft construction, 227*A*.
SAPIRO, S., carbon elimination in open-hearth process, 213*A*.
SARJANT, R. J., deoxidisers, 11*A*.
SARX, H. F., rust-preventing paint, 24*A*.
SATTELE, L. F., effect of magnesia and alumina in slag on blast-furnace operation, 209*A*.
SAUNDERS, S. G., waste heat, 207*A*.
SAVOSTIN, V., open-hearth practice, 183*A*.
SAWYER, R. A., spectrum analysis, 235*A*.
SCHERER, R., embrittlement of heat-resistant steel, 226*A*.
SCHIERHOLZ, O. J., organic coatings, 23*A*.
SCHMIDT, L. D.:
coking properties of coal, 175*A*.
oxidation of coal, 92*A*.
SCHMIDT, O., normalising and annealing of welded joints, 60*A*.
SCHNEE, V. H., foundry practice, 96*A*.
SCHNORRENBERG, W., aluminium coatings, 114*A*.
SCHOENMAKER, P., high-tensile steel, 31*A*.
SCHROEDER, detection of caustic embrittlement, 232*A*.
SCHROEDER, A. J., cutting efficiency of tools, 186*A*.
SCHUBERT, C. E., testing of core oils, 137*A*.
SCHUCH, J., analysis of cast iron, 75*A*.
SCHULZ, E. H., structural steel, 26*A*.
SCHURECHT, H. G., recrystallisation of magnesia, 43*A*.
SCHUSTER, L. W., obituary notice, 301*P*.
SCHWARTZ, E. B., X-ray study of inclusions in steel, 33*A*.
SCHWARTZ, H. A., structure of cementite, 104*P*.
SCOTT, F. W., electrodes for welding cast iron, 151*A*.
SCOTT, H., hardness conversion tables, 156*A*.
SEARLE, A. B., refractories for reverberatory furnaces, 44*A*.
SEE, W. G., submerged combustion, 4*A*.
SEELIG, R. P., fatigue of porous metals, 156*A*.
SEEMANN, H. E., radiographs, 197*A*.
SELEZNEV, A., agglomerating plant at Ordzhonikide works, 85*A*.
SEMIKIN, I., design of open-hearth furnaces, 50*A*.
SEYFERTH, D. F., plant of West Michigan Steel Foundry Co., 136*A*.
SHALLOCK, E. W., sintering of iron ore, 2*A*.
SHANOVSKIY, E., scarfing of billets, 112*A*.
SHAPIRO, M., inclusions in copper steel and chromium-copper steel, 72*A*.
SHAW, H., insulating concrete for coke-oven doors, 5*A*.
SHELTON, S. M., concentration of manganiferous iron ore, 203*A*.
SHERWIN, E., elected Member, 8*P*.
SHIMOMURA, A., coking properties of coal, 175*A*.
SHIRAKAWA, Y., magneto-resistance effect of iron single crystals, 225*A*.
SHIRLEY, H. T., corrosion tests, 182*P*.
SHNEEROV, YA., increased weight of charge for open-hearth furnaces, 50*A*.
SHORE, A. W., elected Member, 8*P*.
SHORTER, A. E., "Shorterising" process, 148*A*.
SHORTLEY, G. H., stress measurement, 155*A*.
SHOWELL, G. D., elected Associate, 9*P*.
SHTERLING, S. Z., welding with "lying" electrode, 185*A*.
SHVETSOV, B. S., determination of inclusions in iron, 236*A*.
SICKINGER, H., Mecano-Bundy tubes, 21*A*.
SIEBEL, E., brittleness of steel at high temperatures, 226*A*.

SILVERMAN, L., determination of copper, 167*A*.
SIMANOV, YU. P., determination of inclusions in iron, 236*A*.
SIMIZU, A.:
creep-torsion tests, 30*A*.
effect of carbon on creep of steel, 30*A*.
SIMS, C. E., defects in enamel coatings, 190*A*.
SINGER, F., chromite and chrome-magnesite bricks, 174*A*.
SINGER, L., determination of oxygen in steel, 76*A*.
SINNATT, F. S., combustion of coal, 4*A*.
SKINKLE, W. B., electric power in steel industry, 102*A*.
SLATER, J. C., effect of pressure on Curie point of iron-nickel alloys, 199*A*.
SMIRNOV, V., "defectoscope," 123*A*.
SMIRNOVA, Z. A., determination of grain size in steel, 197*A*.
SMITH, D. L., elected Member, 9*P*.
SMITH, E. C., control of steel composition, 122*A*.
SMITH, E. W., carbonisation of coal, 6*A*.
SMITH, F., obituary notice, 302*P*.
SMITH, F. D., stress measurement by magnetostriction, 26*A*.
SMITH, L., use of plastics for mounting microsections, 93*P*.
SMITH, R. P., Perrin process, 75*P*.
SMOLYAKOV, A., blooming mill at Magnitogorsk Works, 102*A*.
SOBOLEVSKY, N. A., idle edging rolls for strip mills, 145*A*.
SOLER, G.:
heating of steel, 141*A*.
refractories for soaking pits, 44*A*.
SORBY, H. C., experimental work, 197*A*.
SORDAHL, L. O., measurement of temperatures in open-hearth furnaces, 103*A*.
SORENSON, J., heat-treatment furnaces, 150*A*.
SOROKIN, P., action of sulphur on steel, 142*A*.
SOSMAN, R. B., measurement of temperatures in open-hearth furnaces, 103*A*.
SPERANSKAYAY, M. P., effect of grinding on structure of quenched steel, 186*A*.
SPETZLER, E., effect of hydrogen sulphide on iron, 36*A*.
SPIERS, H. M., silica bricks, 205*A*.
SPOONER, A. P., cleaning of billets, 20*A*.
SPRAGAGEN, W.:
cutting of metals, 18*A*.
oxygen-cutting of steel, 109*A*.
SPRAY, S., centrifugal casting of pipes, 9*A*.
SPRUNK, G. C.:
coking properties of coal, 175*A*.
hydrogenation of coal, 92*A*, 93*A*, 134*A*.
STANLEY, G. O., elected Member, 8*P*.
STANLEY, L. R., elected Associate, 9*P*.
STAVERT, J. C., high-test cast iron, 48*A*.
STECKLER, S., X-ray study of inclusions in steel, 33*A*.
STEENBERG, B., ageing of iron, 118*A*.
STEEVER, A. M., forging of tool steel, 216*A*.
STEVENS, G. J., machining of stainless steel, 19*A*.
STEVENSON, W. W.:
Paper: "An Accelerated Spray Test for the Determination of the Relative Atmospheric Corrodibility of Ferrous Materials." *See* SWINDEN, T.
STEWART, G. B., elected Member, 8*P*.
STEWART, M., liquid carburising, 219*A*.
STEWART, R. C., heat treatment of metals, 105*A*.
STONE, E. H. F., elected Associate, 9*P*.
STORCH, H. H., hydrogenation of coal, 6*A*, 92*A*, 93*A*, 134*A*.
STOTT, J., determination of copper in cast iron, 234*A*.
STRAUSS, J., hardenability of steel, 157*A*.
STRAUSSER, P. W. C., corrosion tests on metallic coatings, 163*A*.
STRICK, G. H., obituary notice, 302*P*.
STRINGFELLOW, H. A.:
reactive wire drawing, 56*A*.
wire-drawing machine, 143*A*.
STRUDWICKE, A. W., elected Associate, 9*P*.
STUART, W. A., refractory bricks, 87*A*.
SUBBARAMAN, P. R., estimation of iron and titanium, 166*A*.
SUMNER, A. N., coal dust in moulding sand, 137*A*.
SURTEES, W., elected Member, 8*P*.
SUZUKI, M., abrasion of cast iron, 28*A*.

SWAN, J. C., permanent magnets, 225*A*.
SWEENEY, H. J., sulphur control in basic open-hearth practice, 138*A*.
SWIFT, H. W., plastic flow in metals, 64*A*.
SWINDEN, T.:
evaluation of inclusions, 257*P*.
Perrin process, 73*P*, 80*P*.
strain-ageing of steel, 224*P*.
SWINDEN, T., and W. W. STEVENSON: *Paper:* "An Accelerated Spray Test for the Determination of the Relative Atmospheric Corrodibility of Ferrous Materials," 165*P*. *Discussion*, 179*P*. *Correspondence*, 183*P*. *Authors' Reply*, 186*P*.

TAKEDA, S., iron-aluminium-silicon diagram, 199*A*.
TALBOTT, D. W., heat- and corrosion-resistant castings, 227*A*.
TAPSELL, H. J.:
creep of metals, 225*A*.
creep under combined tension and torsion, 226*A*.
TAWARA, K., determination of inclusions in steel, 237*A*.
TAYLOR, F. W., elected Member, 8*P*.
TAYLOR-AUSTIN, E., analysis of cast iron, 166*A*.
THAU, A., low-temperature carbonisation in Germany, 176*A*.
THEXTON, J., elected Associate, 9*P*.
THIEL, G., scaling of metals, 15*A*.
THIELEMANN, R. H., rupture tests of alloy steels at high temperatures, 160*A*.
THOMAS, F. J., lubrication of rolling mills, 145*A*.
THOMAS, H. SPENCE, obituary notice, 293*P*.
THOMAS, R. V., elected Member, 8*P*.
TIBBENHAM, L., welding of cast iron, 107*A*.
TICHVINSKY, L. M., wear of metals, 157*A*.
TIGERSCHIÖLD, M., fuel economy at Swedish works, 4*A*.
TILL, J. W., elected Member, 8*P*.
TIMMINS, A. A.:
Paper: "The Decomposition of Pearlite in Grey Cast Iron," 123*P*.
TIMMONS, G. A., cast iron for brake drums, 194*A*.
TITOV, G. N., impact test-pieces, 117*A*.
TÖDT, F., commencement of corrosion of iron, 35*A*.
TOPERVERKH, N., control of open-hearth furnaces, 101*A*.
TOUR, S., pickling and polishing of metals, 113*A*, 188*A*.
TOY, H. B., obituary notice, 303*P*.
TRANTER, G. D., casting-pit practice, 213*A*.
TRAUTSCHOLD, R., control of open-hearth furnaces, 11*A*.
TREPPSCHUH, H., calculation of internal stresses in cylinders, 26*A*.
TRISE, H. R., elected Member, 8*P*.
TROIANO, A. R., decomposition of austenite, 198*A*.
TROSSEN, W., hardness testing machines, 27*A*.
TUCKER, R. C.:
chromium cast-iron, 162*A*.
corrosion tests, 179*P*.
deoxidisers, 11*A*.
remarks on Walton's paper, 31*P*.
elected Member, 9*P*.
TURNBULL, D. C., grinding of rolls, 187*A*.
TURNBULL, L. G., pyrometers, 147*A*.
TURPIN, W. S., elected Associate, 9*P*.
TYULENEV, V. N., microstructure of cast iron, 71*A*.

UHLIG, H. H., pitting of stainless steel, 126*A*.
UNGER, A. M., spot welding machines, 151*A*.
UNVERZAGT, W. E., creep of alloy steels, 159*A*.
UNWIN, D. J. D., elected Associate, 9*P*.
UTTLEY, J. A., elected Member, 9*P*.

VACHER, H. C., bentonite, 173*A*.
VANDERBERG, W. O., mineral deposits in Nevada, 1*A*.
VAN DER HOEVEN, J. C., oil-refining plant of Wheeling Steel Corporation, 133*A*.
VAN DER HORST, H., chromium plating of automobile cylinders, 21*A*.
VAN DUZER, R. M. jun., turbine materials, 161*A*
VAN MOLL, J. A. M., elected Member, 9*P*.
VAN URK, A. TH., magnets, 66*A*.
VAUPEL, O., X-ray examination of steel, 32*A*.

VAYNBERG, G. YA., determination of oxygen in steel, 235*A*.
VAYSBERG, Z. M., determination of silicon, 75*A*.
VERNON, W. H. J., corrosion tests, 183*P*.
VICKERY, R. C., elected Associate, 9*P*.
VILELLA, J. R., grain size of steel, 71*A*.
VINCENT, H. B., spectrum analysis, 235*A*.
VLASOV, A. M., molybdenum-vanadium steel, 120*A*.
VOIGT, G., inclusions in steel, 12*A*.
VOLTZ, P., electricity in iron and steel plants, 4*A*.
VORDAHL, M. B., radiography, 71*A*.
VOSBURGH, F. J., carbon linings for blast furnaces, 44*A*.

WADA, I., determination of nitrogen, 77*A*.
WADDINGTON, E. S., welding of sheets, 108*A*.
WAGNER, C., liquidus curves of intermetallic compounds, 125*A*.
WAHL, A. M., stresses in helical springs, 155*A*.
WALD, M. D., pyridine recovery from coke-oven gas, 91*A*.
WALKER, J. H., measurement of corrosiveness, 163*A*.
WALTON, R. R. F.:
Paper: "The Practical Side of Blast-Furnace Management, with Especial Reference to South African Conditions," 13*P*. *Discussion*, 28*P*. *Correspondence*, 33*P*.
WARREN, E. T., blast-furnace of Tata Iron and Steel Co., Ltd., 178*A*.
WARREN, T. E., hydrogenation of coal, 93*A*.
WASHBURN, F. M., slag control in basic process, 11*A*, 182*A*.
WASHBURN, T. F., tensile strength of carbon steel, 153*A*.
WATERFALL, F. D., case-hardening in liquid baths, 148*A*.
WATERHOUSE, G. B., iron and steel production, 7*A*.
WATTLEWORTH, D. R., design of coke ovens, 5*A*.
WEBBER, H. M., control of furnace atmospheres, 59*A*.
WEINGRABER, H. VON, hardness tests, 27*A*.
WELLAUER, E. J., heat treatment of gear wheels, 150*A*.
WELLER, R., stress measurement, 155*A*.
WELLINGER, K., brittleness of steel at high temperatures, 226*A*.
WELLS, C., diffusion of carbon in austenite, 198*A*.
WELTER, G., effect of notches, 67*A*.
WERNER, W., alkali resistance of metals, 36*A*.
WESLEY, W. A., corrosion of copper steel and copper-nickel steel, 163*A*.
WESTBERG, S., evaluation of inclusions, 265*P*.
WEVER, F., transformations in manganese steel, 124*A*.
WHEATON, E. A., low-silicon iron for open-hearth practice, 182*A*.
WHITAKER, P., elected Member, 9*P*.
WHITE, A. E., cracks in high-pressure drum, 165*A*.
WHITE, D., determination of thermal stresses, 192*A*.
WHITE, J.:
manganous-oxide/titanium-dioxide and manganous-oxide/ferrous-oxide/titanium-dioxide systems, 72*A*.
slag systems, 211*A*.
WHITELEY, C., elected Member, 9*P*.
WHITELEY, J. H.:
evaluation of inclusions, 261*P*.
Perrin process, 74*P*.
WHITFIELD, J. F., rolling-mill practice, 58*A*, 218*A*.
WHITING, T. W., elected Member, 9*P*.
WIBERG, M., reduction of iron ore, 209*A*.
WILLETTS, F., elected Member, 9*P*.
WILLIAMS, E. R., continuous casting, 10*A*.
WILLIS, W. H., elected Member, 9*P*.
WILLMOTT, P. L., elected Associate, 9*P*.
WILSON, A. J. C.:
Paper: "Some Properties of Alloy Equilibrium Diagrams Derived from the Principle of Lowest Free Energy." *See* LIPSON, H.
four-component systems, 119*P*.
WILSON, J. P., heat-treatment plant of S. L. Allen Co., 60*A*.
WILSON, S. H., spectrographic analysis, 167*A*.
WILSON, W. W., elected Member, 9*P*.
WINLACK, G. D., deseaming of billets, 112*A*.

WINLOCK, J., yield point of steel, 154*A*.
WIRTH, J. K., corrosion of coated metals, 38*A*.
WOLSTENHOLME, G. E., obituary notice, 304*P*.
WOOD, E., evaluation of inclusions, 267*P*.
WOOD, H. C., coke-oven machinery, 132*A*.
WOOD, W., flocculation of washery water, 5*A*.
WOOD, W. W., remarks at Luncheon, 5*P*.
WORK, H. K.:
determination of carbon in steel, 167*A*.
work-brittleness test, 65*A*.
WRAIGHT, E. A., utilisation of waste in iron industry, 135*A*.
WRIGHT, H. E., high-tensile steel, 119*A*.
WRIGHT, R. H., rolling-mill drives of Carnegie-Illinois Steel Corporation, 145*A*.
WRIGHT, W. G., nickel cast iron, 69*A*.
WYANT, R. A., spot welding of steel, 62*A*.

YAMAGUCHI, M., nickel steel for magnets, 66*A*.
YAMAMOTO, N., wear of metals, 28*A*.
YAMONAKA, N., electrical resistance of nickel, iron, and iron-nickel alloys under tensile stress, 225*A*.
YANCEY, H. F., flocculation of washery water, 5*A*.
YANESKE, B.:
Paper: "The Manufacture of Steel by the Perrin process," 35*P*. *Discussion* 73*P*. *Correspondence*, 82*P*.
YEAW, J. S., corrosion of metals, 35*A*.
YOUNGLOVE, E. H., insulation of hot-blast stoves, 131*A*.
YOUNKINS, J. A., coal washing, 89*A*.
YOXALL, L. S., control of coke ovens, 6*A*.
YUDIN, I. D., protective films from silico-organic compounds, 23*A*.
YUROVSKIY, A. Z., desulphurisation of coke, 91*A*.

ZABEL, G. W., analysis of cast iron, 75*A*.
ZADE, H. P., coating thickness of welding electrodes, 107*A*.
ZAGORODSKIKH, D. M., hardness of steel under stress, 193*A*.
ZAGORUL'KO, A. YA., determination of aluminium in steel, 167*A*.
ZANE, R. E., flocculation of washery water, 5*A*.
ZAPFFE, C. A., defects in enamel coatings, 190*A*.
ZEELANDER, J., rolling of strip, 13*A*.
ZETTERLING, H., foundry equipment in Germany, 180*A*.
ZHUKOVIN, E., carburisation of stainless steel, 104*A*.
ZYRYANOVA, T. G., properties of coke, 134*A*.